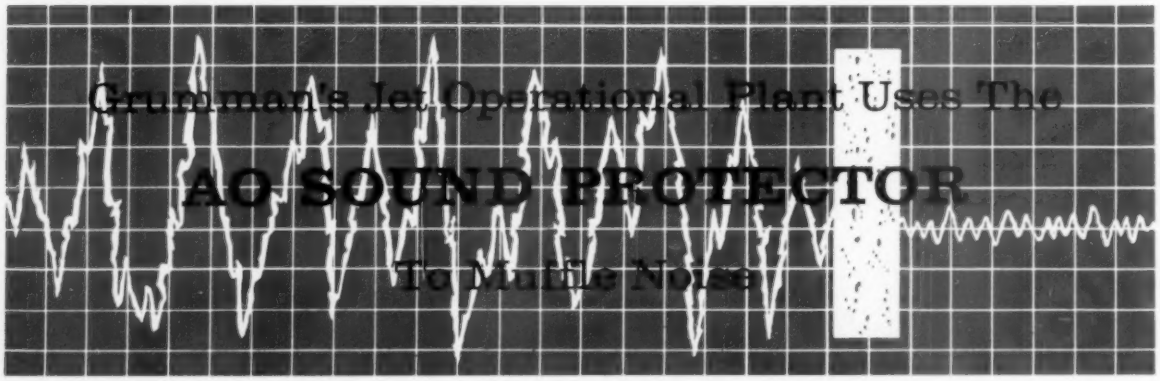
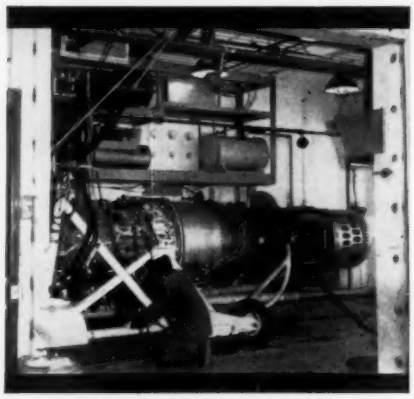
Safety Maintenance

EST. 1901 • AMERICA'S PIONEER MAGAZINE IN ITS FIELD • MAY, 1958 • 50¢

Published By Alfred M. Best Company, Inc.

Jet engine run up check at Riverhead, L. I. plant, Grumman Aircraft Engineering Corp. Note AO Sound Protector on tester. Plane is the Tiger F11F-1. This plane flies supersonic in level flight and is the latest of a long line of Navy fighters produced by Grumman. It is powered by a J65 axial-flow turbo-jet with after burner.





Prior to installation in the plane, the jet engine is repeatedly tested in the Engine Test House. Without AO Sound Protectors, the noise would be intolerable.

A New Year's Eve celebration is quiet as a churchyard compared to checking jet engine run ups! To muffle noise of 140 plus decibels and to prevent fatiguing personnel, Grumman Aircraft Engineering Corp. chose AO 372-8 SOUND PROTECTORS.

Ruggedly constructed, the AO 372-8 Sound Protector maintains performance even after constant off and on use. Many installations report no replacement of any part even after 2 years. Ear seals are solid, comfortable vinyl sponge and *puncture proof* which lowers replacement costs. They are also non toxic and resistant to body oils.

Have a noise problem? Write us for literature containing attenuation charts which clearly prove the superiority of American Optical Sound Protectors over all others tested.

Available in helmets and with adjustable headgear. Also with intercommunication systems.

American Optical COMPANY
SAFETY PRODUCTS DIVISION

Always insist on AO Trademarked Safety Products

SOUTHBRIDGE, MASSACHUSETTS • *Branches in Principal Cities*

(For details, use Key # Q-1 on card on page 1)

BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE. To obtain copies write in the key numbers on the free-postage card below.

MATERIALS HANDLING

Handling Contaminant Materials . 545
S. Blickman, Inc. Folder describes various laboratory enclosures for the safe handling of many types of contaminants. This bulletin should be of special interest to those in the atomic, pharmaceutical, biological chemical and allied fields where "glove-box" enclosures are required.

Hydrogen Peroxide Handling ... 546
Columbia-Southern Chemical Corp. A 4-page brochure describes safe handling techniques for hydrogen peroxide in 30-gallon drums. Pointers on drum storage and opening, valve assembly and care of empty drums are included, illustrated by photographs.

Instruments for Weight Recording, Load Measurements, etc. . 547
Martin-Decker Corp. Three new bulletins describe new instruments for weight indicating, recording and scaling. Specifications and applications are also included.

Materials Handling Techniques .. 548
Lewis-Shepard, Inc. The winter issue of this company magazine is offered to those interested in the problems connected with handling bulk materials. Case histories of mechanized handling techniques in various industries are featured.

Heavy Duty Electric Hoists 549
American Chain & Cable Co., Inc. A new line of electric hoists is described in this 24-page bulletin. Cut-away diagrams explain the internal mechanism of these units. Operational fundamentals are outlined as well as other pertinent data.

Hydraulic Lift Tables 550
Southworth Machine Company. Booklet describes how certain problems of lifting, feeding and work positioning may be simplified. A new series of lift tables is discussed and adaptations of standard models are pictured.

Driver-Load Fork Trucks 551
The Yale & Towne Mfg. Co. A new brochure uses sectionalized views and a system of die cut pages to pictorially disassemble a new fork lift truck. Booklet describes pallet, platform, stacker and tractor models.

Steel Frame Hand Trucks 552
The Fairbanks Co. Brochure provides information on hand and platform trucks for the handling of various types of materials. Specifications and accessory equipment are also mentioned.

PERSONAL PROTECTION

Coated Fabric Work Gloves 553
The Granet Corp. A colorful catalog describes the latest additions to this company's line of industrial work gloves. Specifications of the various gloves are given and their uses are outlined. Booklet also contains a chart showing the resistance to chemicals of various coated gloves.

Utility Rain Suit 554
American Optical Co., Safety Products Div. Bulletin provides a brief review of a new neoprene coated rain suit. The suit is designed for utility line crews, pipeline workers, etc. Suit is available in safety yellow for wear after dark, and has non-conductive fasteners.

Acid-Resistant Work Gloves 555
Surety Rubber Co. Bulletin describes a new glove that is designed to be resistant to many acids, glue and the abrasive action encountered in sand blasting. Glove features a new cuff style for better protection when turned down.

Welder's Goggles 556
Glendale Optical Co., Inc. Brochure depicts welder's goggles which have a new ventilating system to prevent fogging and resist harmful infra-red and ultra violet rays. Goggles for chippers are also described.

Industrial Glove Chart 557
Pioneer Rubber Co. An attractively illustrated two-color wall chart with an easy-to-read index displays the full line of this company's work gloves. Chart gives all necessary information on each model as to material, weight, size, etc. An instructional guide is also furnished with this chart to help purchasing agents, etc. select a particular glove for a certain job.

FIRE PROTECTION

Proprietary Sprinkler Supervision 558
Notifier Corp. Bulletin outlines specifications for Class "A" proprietary sprinkler supervision and installation. All phases of supervision from alarm stations to coding and recording equipment are covered.

Fire and Burglarly Detection Systems 559
Walter Kidde & Co., Inc. An eight page brochure describes and illustrates carbon dioxide fire extinguishing systems, fire detection equipment, ultrasonic and photo-electric burglar detection systems. A chart outlining the suitability of portable fire extinguishers for use on various types of fires is also included.

FIRST AID & HYGIENE

Stretchers 560
The Washington Products Co. Catalog defines a complete line of portable and emergency stretchers. Accessory devices are also featured. All models are illustrated.

(Continued on the next page)

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May, 1958 Please send me the following free data

Free Bulletins (Cont'd)

Centrifugal Precipitator 561
American Air Filter Co., Inc. Bulletin includes drawings and illustrations which show this unit's construction, different dimensions, and uses. Centrifugal precipitators are used for primary dust collection, in pneumatic conveying, etc.

Dermatitis Prevention 562
Huntington Laboratories, Inc. This important booklet, entitled "The Prevention of Occupational Skin Diseases," was written by a former director of the U. S. Public Health Service in collaboration with a technical committee of the Association of American Soap & Glycerine Producers, Inc. Booklet stresses proven procedures to be used in the prevention of industrial dermatitis.

Balancing Air Diffusers 563
Illinois Testing Laboratories, Inc. Data book describes in some detail procedures to be followed for testing and balancing air diffusers with an Alnor Velometer. Complete engineering data on leading brands of diffusers and instructions on a method that establishes actual air delivery of the various types and sizes of units are detailed.

Snake Bite Kit 564
E. D. Bullard Co. Brochure is designed to brief readers on a new, compact snake bite kit. The kit, about the size of a pocket knife, contains suction cups, antiseptic, knife blade and a lymph constrictor. Illustrated instructions highlight the usefulness of this unit.

Emergency Decontamination Showers 565
Logan Emergency Showers, Inc. Catalog highlights the need and importance of drench showers to any effective emergency first aid program. Units are available to fight varying degrees of contamination. Illustrates and describes various permanent and portable models for protection from fire, chemicals, bacteria, radioactive contaminants, etc.

Floor Surfacing Material 566
The Master Mechanics Co. This 8-page illustrated brochure furnishes test data on a new floor surfacing material used to increase the strength of worn floors. Various floor problems are discussed and the application of this product to their solution is reported.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Reader's Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	*Subject*
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Clothing
109	Safety Belts
110	Safety Gloves
111	Foot Protection
114	Welding Helmets
115	Welding Curtains
	FIRST AID AND PERSONAL HYGIENE
120	Protective Skin Cream
121	Skin Cleansers
122	Sanitary Drinking Facilities
124	Salt Tablets
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
130	Throat Medication
131	Eye Wash Fountains
132	Hand Drying Facilities
133	Disinfectant—Deodorants
134	Hearing Testers
135	Hearing Protectors
136	Noise Analysis
137	Emergency Rescue Kits
	FIRE PROTECTION
141	Safety Cans
142	Fire Alarms
143	Safer Solvents
144	Degreasing Machines
145	Drum Safety Valve
147	Fire-Resistant Hydraulic Fluids
148	Watchmen's Control Systems
149	Extinguishing Ash Trays
	LIGHTING EQUIPMENT
150	Alarms & Warning Lights
153	Fluorescent Lamp Guards
154	Emergency Lights
	MAINTENANCE
160	Anti-Slip Floor & Mats
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Floor Cleaning Machines
164	Floor Resurfacing Materials
165	Paints
166	Industrial Wipers
167	Roof Coatings
	LADDERS & HANDLING
170	Ladders
171	Ladder Safety Devices
172	Scaffolds
173	Work Platforms
174	Sling & Rope Tester
175	Safety Hooks
177	Plastic Acid-Containers
	GUARDS
178	Machine Guards
179	Power Press Feeders
180	Safety Tools
181	Vacuum Sheet Lifters
182	Valve Operators
	EDUCATIONAL AIDS
191	Safety Signs
192	Safety Awards & Emblems
193	Employee Safety Guide
194	Bulletin Boards

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ALFRED M. BEST COMPANY, INC.
75 FULTON STREET
NEW YORK 38, N. Y.

Service Dept.

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Safety Maintenance

formerly "SAFETY ENGINEERING"

Volume 115, Number 5 **May, 1958**

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Cover picture by courtesy of American Optical Co.

AMERICA'S PIONEER MAGAZINE IN ITS FIELD

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it's SAFE to say

● WHY "BUY" INJURY?

IN too many plants, the buyer of supplies and products confuses his title of "purchasing agent" with that of czar. Fortunately, this unhappy state of affairs does not exist in the majority of industrial companies and certainly not in the well organized purchasing department of any progressive plant.

Granted that the truly dedicated purchasing agent—regardless of his actual title—can be a splendid watchdog of the company's treasury in the finest sense of that phrase, he has certain responsibilities which become actual obligations to the company and the working staff. The first of those obligations is that he must not "purchase" injuries! It is very easy to do.

It is axiomatic that generally we get what we pay for and nowhere is this truth shown up with greater strength than in the area of safety products, devices and equipment. Shoddy safety equipment—whether it be "war surplus" fire extinguishers, bargain-counter goggles, respirators or safety shoes can be expected to deliver shoddy protection. Normally this is merely a harmless way of assuring ourselves that good money is poured down the well-known drain. In the case of injury-prevention, however, that procedure becomes unrealistic, dangerous and infinitely more costly in the long run.

Sunday papers in the large metropolitan centers often contain plenty of advertising describing fabulous discounts on surplus material offered by certain mail-order houses who are prepared to ship everything from goggles to nylon tents, crossword puzzles, cosmetics, household ornaments and women's girdles. It is almost inconceivable that any purchasing agent worthy of the name would even consider placing an order for safety equipment in response to that advertising. Nevertheless, somebody must buy the stuff and we shudder to think of the dangerously false sense of security built up in the minds of the working staff using such "protection."

The most serious responsibility—or obligation—of the purchasing director is to subordinate price considerations if the hazards otherwise become intensified. Certainly this is true especially at a time when newspapers are headlining unemployment figures or screaming about a recession. Any misguided attempt to "economize" on safety equipment as the result of such headlines can be very costly indeed.

It will become a sorry day when top management permits a purchasing department to buy injury. The price will be very high. On the contrary, the blue-chip companies of America long ago demonstrated that the purchasing agent, working in close cooperation with safety and operating officials, can purchase safety—the only genuine bargain on any production line.

do your employees know the answers?

which worker is lifting safely? 1

2 *which safety rule is this worker violating?*

should hand trucks or carts be pulled or pushed downhill? 3

4 *is this worker following good safety practice?*

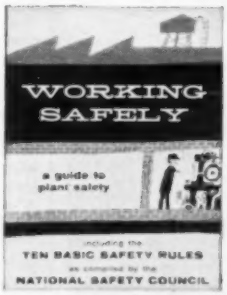
Give your workers a safety refresher course with "Working Safely"... a new safety booklet available from your STEEL SERVICE CENTER stocking Inland 4-WAY® Safety Plate

Safety is a subject we can never learn too much about. That's why you will be doing yourself and the employees in your plant a favor by providing them with copies of this new pocket-size guide to plant safety. "Working Safely" has been compiled by the Safety Engineers of Inland Steel Company and includes the ten basic safety rules of the National Safety Council as well as safety tips on many other subjects.

Copies of this booklet are available from your STEEL SERVICE CENTER.

Another Good Safety Rule—To cover those areas in your plant and on your products where feet and wheels must have safe, sure traction, use Inland 4-WAY Safety Plate . . . 4-WAY is available in large, medium or small pattern, in a wide range of sizes and gages, from your local STEEL SERVICE CENTER . . . the most logical source of supply for less-than-carload orders of steel and specialized steel services.

INLAND 4-WAY® SAFETY PLATE



answers:

1. Worker on right is lifting safely. Always bend knees when picking up heavy loads.

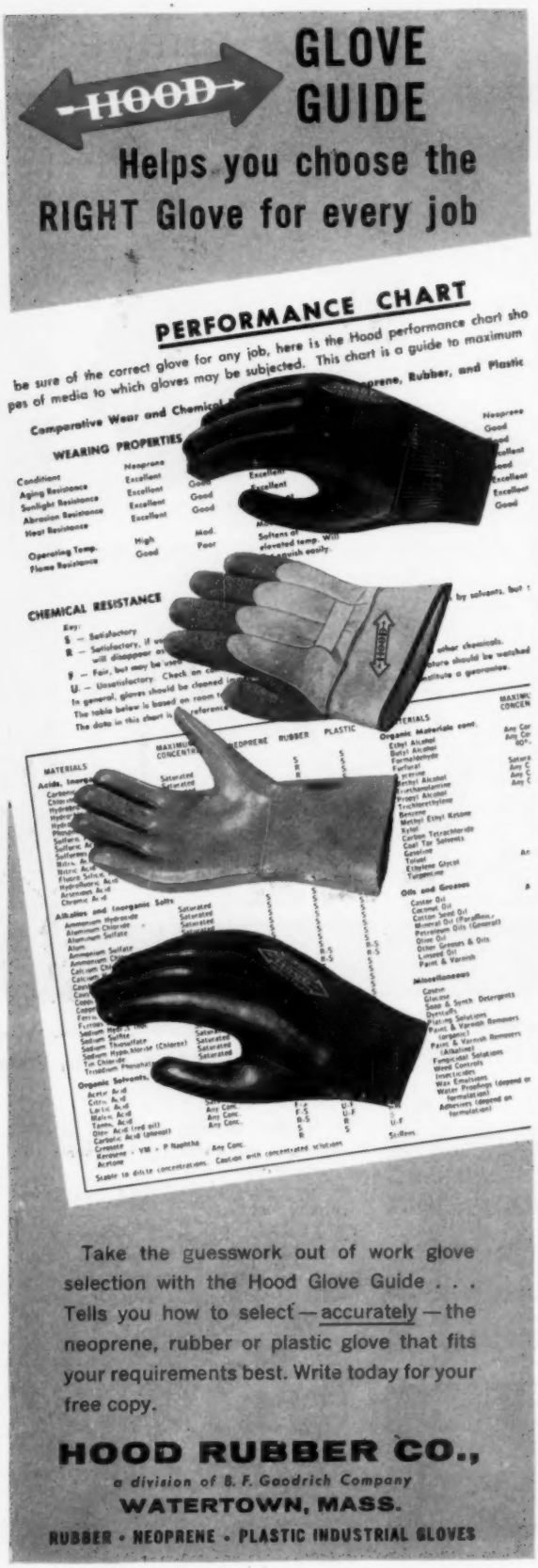
2. No safety shoes! He's risking a broken foot or toe!

3. Pushed... always. When you pull a cart, it can get away and run you down.

4. No! Never paint a ladder. It covers up cracks and weaknesses. Use clear varnish instead.

Inland Steel Company
30 West Monroe St., Chicago 3, Illinois

(For details, use Key # Q-2 on card on page 1)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GLOVE GUIDE
Helps you choose the RIGHT Glove for every job
PERFORMANCE CHART
Take the guesswork out of work glove selection with the Hood Glove Guide . . . Tells you how to select — accurately — the neoprene, rubber or plastic glove that fits your requirements best. Write today for your free copy.
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CHECK LIST of aids to production

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Flammable Liquid Storage 37
9-Way Fire Truck 39
New Fire-Fighting Suit 63
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Combustible Gas Alarm 64
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You get so much **MORE** out of B&L **PROTECTION-PLUS** Safety Glasses!

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COMBINATION Y-90

METAL M-40

+ **PROTECTION** • Frames unsurpassed in strength and durability. Bal-SAFE lenses . . . plano or prescription . . . give *maximum impact resistance.*

+ **ECONOMY** • Exclusive "integrated" design of line (interchangeable parts and accessories) means smaller inventory. Frame life expectancy is demonstrably greater.

+ **WORKER ACCEPTANCE** • Products of nation's top ophthalmic specialists . . . expert in modern eyewear development . . . styling and comfort.

When you standardize throughout your plants on Bausch & Lomb Safety Eyewear, you're in the best possible position to demonstrate . . . to workers AND management . . . the wisdom of your choice. You get maximum protection *plus* economy *plus* your workers' hearty OK. Want to be "filled in" on the latest in this line? Call the Bausch & Lomb supplier in your area, or write: Bausch & Lomb Optical Co., 90529 Smith Street, Rochester 2, New York.

BAUSCH & LOMB

SINCE B&L 1853

On man and woman at top, T-60 Two-Tone Frames.

(For details, use Key # Q-4 on card on page 1)

Norfolk, Va. *May 1–3*

Virginia Safety Association Conference (Monticello Hotel). James T. Wadkins, Mgr., Virginia Safety Association, 2501 Monument Ave., Richmond 20, Va.

Allentown, Bethlehem, Easton, Pa. *May 5–7*

Thirty-first Annual Eastern Pennsylvania Safety Conference. Harold A. Seward, Lehigh Valley Safety Council, 602 E. 3rd St., Bethlehem, Pa.

Berkeley, Calif. *May 6–7*

Sixth Annual Eastbay Safety Congress and Exhibit (Claremont Hotel). Eastbay Chapter National Safety Council, 1322 Webster St., Oakland 12, Calif.

Buffalo, N. Y. *May 6–8*

Eighteenth Annual Western New York Safety Conference & Exhibit (Hotel Statler). Clifford H. Seymour, Executive Secretary, Western N. Y. Safety Conference, P.O. Box 315, Niagara Falls, N. Y.

Asheville, N. C. *May 14–16*

Twenty-Eighth Annual North Carolina Statewide Industrial Safety Conference (Battery Park Hotel). H. S. Baucom, Director of Safety, N. C. Industrial Commission, Raleigh, N. C.

Chicago, Ill. *May 19–23*

Sixty-Second Annual Meeting of the National Fire Protection Association (Palmer House). National Fire Protection Association, 60 Batterymatch St., Boston 10, Mass.

Louisville, Ky. *May 20–21*

Kentuckiana Safety Conference and Exhibit (Kentucky Hotel). Estel Hack, Executive Vice-President, Louisville Safety Council, 214 Speed Bldg., Louisville 2, Ky.

Duluth, Minn. *May 22–23*

Thirty-fourth Annual Conference, Lake Superior Mines Safety Council, Allen D. Look, Secretary, 329 Federal Building, Duluth 2, Minn.

Cleveland, Ohio *June 9–12*

Eighth National Materials Handling Exposition (Public Auditorium). Clapp & Poliak, Exposition Management, 341 Madison Ave., New York 17, N. Y.

Bridgeport, Conn. *June 11–12*

Thirteenth Annual Connecticut Safety Conference (Stratfield Hotel). A. V. Short, 15 King St., Wallingford, Conn.

Cleveland, Ohio *September 16–18*

Twentieth Annual Safety Conference (Pick-Carter Hotel). H. G. Hayes, Secretary-Treasurer, Ohio State Safety Council, 8 East Chestnut St., Columbus 15, Ohio.

Rockland, Me. *September 18–19*

Thirty-First Annual Maine State Safety Conference (Samoset Hotel). Arthur F. Minchin, Secretary, Department of Labor and Industry, State House, Augusta, Maine.

Chicago, Ill. *October 20–24*

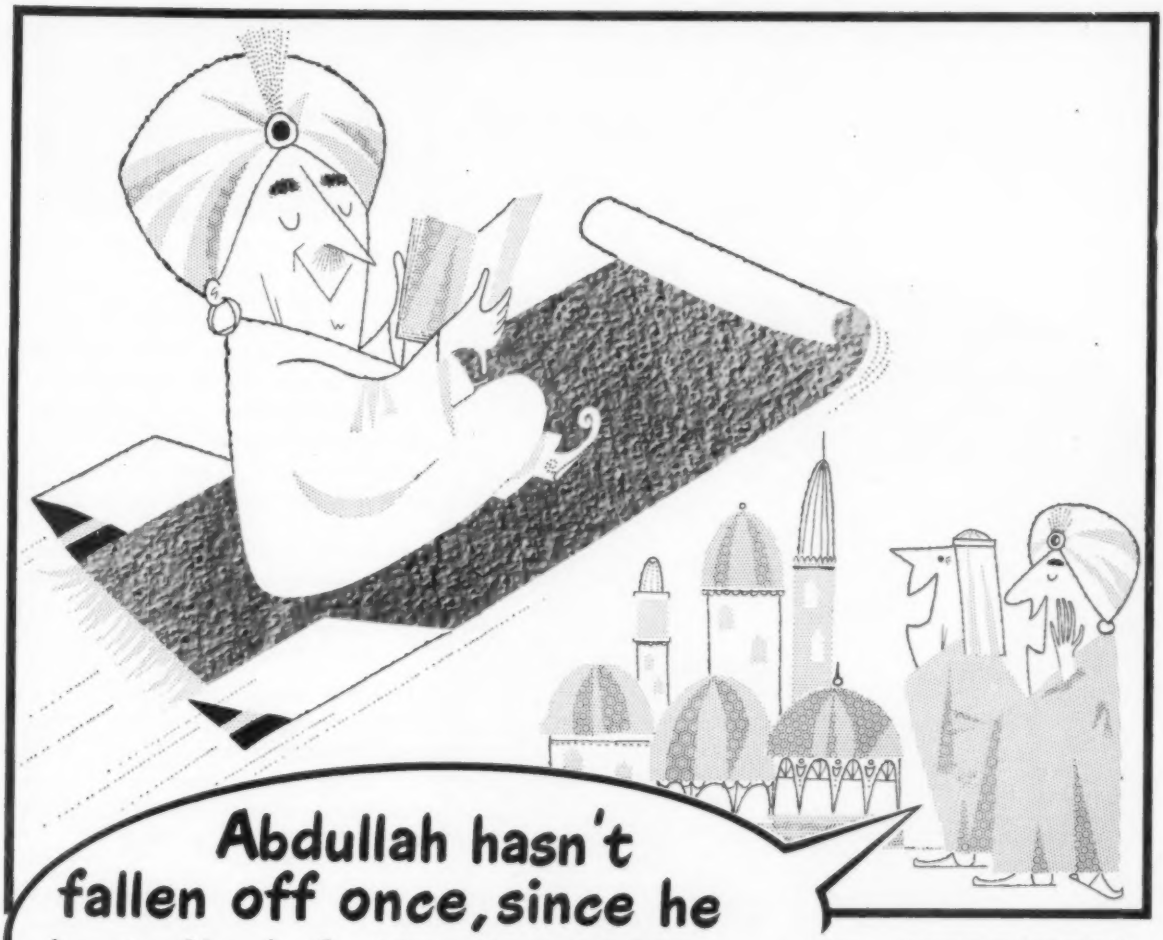
Forty-Sixth National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Philadelphia, Pa. *November 3–6*

Third Annual Industrial & Building Sanitation Maintenance Show (Convention Hall). Orkin Exposition Management, 19 W. 44th St., New York 36, N. Y.

Jacksonville, Fla. *November 13–15*

Eleventh Annual Convention of the International Rescue and First Aid Association (Hotel George Washington). Max L. Spray, executive director, International Rescue & First Aid Assoc., 101 N. Alfred St., Alexandria, Va.

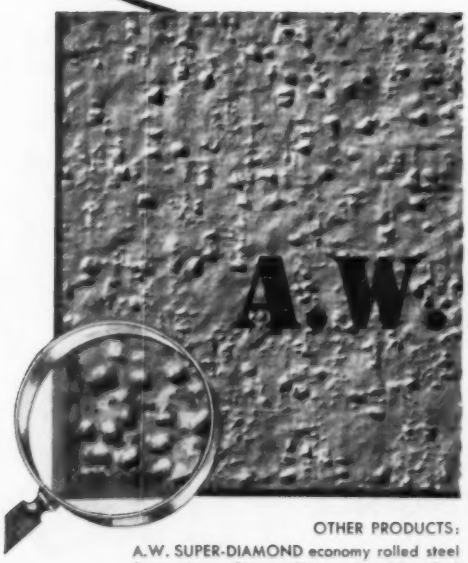


Abdullah hasn't fallen off once, since he installed A.W. ALGRIP!

Now . . . he can even do aerobatics without ever using a safety belt. Abdullah knows that traction results from friction and that A.W. ALGRIP Rolled Steel Floor Plate provides the best traction possible wherever slipping might occur.

A.W. ALGRIP is made by a patented process in which grinding wheel type abrasive is rolled—*not coated*—to a controlled depth, as an integral part of tough steel floor plate. Wear merely exposes more abrasive . . . safety lasts for the life of the installation.

Check your plant for areas where slipping hazards may exist. A.W. ALGRIP provides supersafe footing under the most hazardous slipping conditions . . . even where water, oil or grease may collect . . . even on inclined surfaces. A.W. ALGRIP can be installed as independent flooring or flooring overlay. Send the coupon for A.W. ALGRIP information, today.



A.W. ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

ALGRIP—*approved for safety by Underwriters' Laboratories*

ALAN WOOD STEEL COMPANY
Conshohocken, Pa.

Please send A.W. ALGRIP Booklet AL-E32

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OTHER PRODUCTS:
A.W. SUPER-DIAMOND economy rolled steel floor plate—Plates—Hot and cold rolled sheet and strip—(Alloy and Special Grades)

(For details, use Key # Q-5 on card on page 1)

A trainee taught us some ABC's

At a briefing of trainees one of the boys asked: "Can I buy U. S. Savings Bonds through the Company and have my deductions made automatically?" Frankly we had assumed that all of our employees knew all about the Payroll Savings Plan.

As a matter of fact, we've had the Plan in operation here for years. We decided to make sure that *everyone* on our payroll got full information, right away.

Our State Savings Bond Director saw to it that we got a full stock of promotional material to stimulate interest in U. S. Savings Bonds. After that he helped us to conduct a personal canvass and give everyone an application blank.

What happened next was surprising. Our employee participation jumped to a really substantial percentage. When our people had all the facts they were glad to gain the security that U. S. Savings Bonds offer them.

Today there are more Payroll savers than ever before in peacetime. Your State Director will be happy to help you install a Payroll Savings Plan or build enrollment in one already existing. Look him up in the phone book or write: Savings Bonds Division, U. S. Treasury Dept., Washington, D. C.

SAFETY MAINTENANCE

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTIC DONATION, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

THE PURCHASING AGENT BUYS SAFETY

There are many responsibilities in the field of safety and safety engineering which logically become a part of the purchasing activity in a well organized purchasing division of a company:

The first responsibility of the purchasing agent is to give his full cooperation to the safety engineer and all other divisions who contribute to decisions that affect the working conditions of his associates.

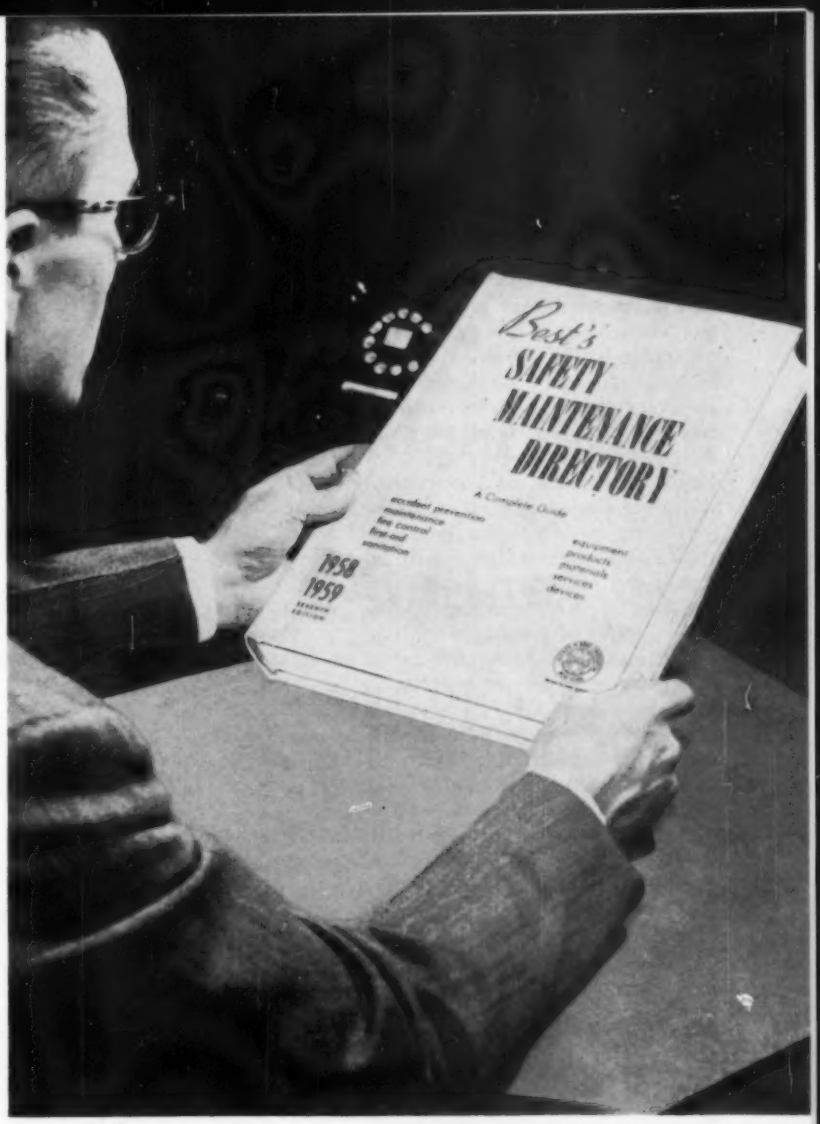
The second responsibility of the purchasing agent is to obtain a knowledge of the nature, causes and areas of the accidents that occur in the operation of his company's facilities.

The third responsibility of the purchasing agent is to transmit to the safety engineer all data on hazardous materials and equipment, and to assist in writing specifications for them.

The fourth responsibility of the purchasing agent is to select qualified and reliable suppliers.

The fifth responsibility of the purchasing agent is to prepare a purchase order that completely describes all hazardous materials and provides for all applicable warranties.

The sixth responsibility of the purchasing agent is to subordinate price considerations if the hazards in the handling or use of the material will otherwise be greater.



The purchasing agent plays an important role in seeing that his company DOES NOT PURCHASE INJURIES as part of the purchase of materials.

by **G. H. REINIER**
Director of Purchases
Abbott Laboratories
North Chicago, Ill.

These precepts of the buyer's part in safety are so important to the well being, life, limb and health of his associates, that we would prefer to call them obligations—obligations not to be discharged carelessly.

Let us examine how each of these responsibilities may become a day to day part of the buying job.

The first: Cooperation. Without this priceless ingredient in the job attitude, our program is lost. Without willing cooperation—the kind of cooperation that we are willing to give because we know that our value on the job increases because of it—without that kind of cooperation, no one of the other five responsibilities we lay at the feet of the purchasing agent, can be fully discharged. If we are to have the purchasing man show this important attitude toward safety, we must give it fertile soil in which to develop. The safety engineer must return in kind. He must be grateful for whatever effort purchasing expends. He must encourage it even when it falters and is ineffective. If we are to have real contributions from purchasing in this important field, we will want

day to day consciousness by the buyer of the need for this help from the purchasing man. Only the safety engineer can really engender this consciousness in the purchasing man and keep it alive.

The second responsibility: To have a knowledge of what causes accidents. Most of this information will come to the purchasing agent in reports from the safety engineer. Regular reports make an excellent basis on which to establish conferences and studies. A visit to the scene of an accident and a physical examination by the purchasing agent of the questionable machine or material will increase and make more meaningful the data he receives in the reports. The manager of purchases will find it invaluable to invite the safety engineer to sit in on purchasing staff discussions relative to safety problems. Through these department-wide sessions, a uniform program of "purchasing-for-safety" can easily be inaugurated.

For example: In our company several of the office personnel caught their fingers in a desk drawer of unusual design. One department manager had his finger broken because of it.

If the safety engineer does not inform purchasing of this "defect," the manufacturer is entirely unaware of the existing hazard and never changes design, or, never is prodded to "improve" the design.

The third responsibility: Transmission of data on hazards. A good purchasing agent will receive thorough information on hazardous materials from his suppliers. Just to pass this data on to the safety engineer may not be enough. In some organizations the plant physician or nurse, the department manager of the using department, the engineering department, the personnel department, and so forth, may have an interest. Or it may be that a safety committee, plant security committee, product development or research group is involved. Whatever the organization's needs, the purchasing agent is obligated to make certain that provisions have been made to notify all who are interested. In most cases, by agreement, the safety engineer will handle most of this. The buyer can be helpful by supplying multiple copies of the data to the safety engineer thus reducing the time and work in his office in passing the information along.

The safety minded purchasing agent will always discuss with the supplier all aspects of handling new materials. He will investigate and evaluate the engineering talent of his equipment suppliers in order that he can obtain machinery that have "accidents designed out" of them. He will realize that in this day of allergies, many materials from which workers' clothing, tools and packages are made might cause skin or respiratory allergies in the workers who contact them. Lost time, due to these causes, is just as complete a loss as time lost due to injury. For this reason the purchasing agent who follows the safe course will have the suppliers

"HE'S A STICKLER FOR SAFETY!"

enumerate the ingredients in the materials he buys. He will have this data checked by his safety people and technicians before he introduces a new material on the premises.

An example of how not to do it was demonstrated by the buyer who was offered a job lot of rubber gloves for laboratory workers. The gloves passed visual inspection in good shape and the price was remarkably low. It was not until the workers used them that it was found that most wearers, on exposure for some time, developed a rash. The buyer, of course, was stuck with his bargain!

An intelligent safety engineer will invite the purchasing man to assist in writing the specification. The purchasing agent is familiar with the language of buying. He often knows what interpretation the seller will place on the words or detail of the description. Before bids are requested or an order is written, the purchasing man can frequently spot faulty or incomplete specifications.

The fourth responsibility: Selection of responsible and qualified suppliers. If there is one act for which the purchasing man should be eminently qualified, this is it. His title and job responsibility are all tied into this task. The purchasing man specializes in this activity. Management expects buyers to perform this one important act: The selection of the right supplier. The purchasing man's attention to the selection of the vendor who is best able to do the job required is as natural—as necessary—and as important as the diagnosis of the disease by the doctor before treatment is begun. The selection of the supplier is the area where the purchasing agent can most frequently make his greatest contributions.

Fifth: Preparation of a proper purchase order. Not only will the purchase order need to describe the material carefully, but it will need to show what standards it must meet. Reference to an established minimum standard should be made if one exists. If the specifications are at variance from the standard, the purchase order should show these exceptions. The purchase order can not be considered complete unless it refers to all warranties which the supplier is excepted to provide. It should contain a forthright statement as to the time required to inspect the product before payment will be made. When equipment is involved, the purchase order should include a statement that the parts or assemblies shall conform to all provisions of law pertaining to the type of equipment ordered. Packing instructions should clearly state the safest means of handling the material.

Sixth: Price shall be subordinate to safety. It is a simple fact that the price of an item usually reflects the amount of labor expended in the preparation of the product as well as the raw materials that were used in its fabrication. The addition of safety features usually adds to the price.

But, it does not always mean that it adds to the cost. Purchasing men are learning that price is not the criteria; therefore, the purchasing agent's total responsibility for price rests with costs. These costs include not only the price of the material but subsequent costs of deterioration, obsolescence and handling. Unsafe features and substandard quality add to the cost of the product. The purchasing agent will be interested in establishing minimum requirements for safe handling, safe storage, and safe use of any material he buys. This includes ingredients as well as equipment.

The buyer can do many things to increase the safety of handling material, for example:

1. **He can cut down on the package weights of materials he buys to permit one-man handling in the warehouse.**

2. **He can assist in the design of shapes and types of packages which can be handled with less chance of accident or injury.**

3. **He can insist on adequate markings to show the handler what particular care should be taken.**

4. **He can make certain that the safety engineer and the machine operator have complete and full instructions on the operation of all machines.**

A typical example of a change which increased safety was a recommendation a buyer made recently of a supplier of pipes and fittings. Instead of wiring the pipes and fittings together and shipping them loose, the buyer insisted that they be placed in a bag or be wrapped as a bundle to permit rapid handling of the parts without the danger of injury. How the supplier packages and how he marks the materials he sells is the unquestionable responsibility of the buyer.

To summarize all six points, the buyer's responsibilities do not change with the inauguration of a safety program. The responsibilities have always existed. He must now do a little more of everything than he did before to make the program workable. Experience has taught us that we cannot hope to stop all accidents in industry. People are discovering new ways to get hurt faster than safety engineers can correct the causative conditions. Experience has also taught us that there is still some distance to go before we will be taking full advantage of the combined potential ability of the safety engineer and the purchasing agent to help in accident prevention. As long as more than a million and a half people annually have accidents in industry we shall continue to encourage a closer cooperation by those in industry best qualified to do something about accident prevention. With the help of the purchasing agent, the safety engineer can go a long way in avoiding the purchase of injuries as a part of the purchase of materials.

From an address presented at the 44th National Safety Congress.

The Right Shoe on the Right Foot

At least one employee of Diamond Alkali Company's Buckeye Soda plant at Painesville, Ohio, doesn't need to be "sold" on the value of safety shoes. Fortunately, he found out "the safety way" instead of "the injury way."

Jerry Talbot had been stacking 100-pound bags of metasilicate on a wooden pallet and was waiting for a fork-truck operator to lift the load and cart it away to a box car. During the lifting operation, the heavily loaded pallet was accidentally rammed onto Jerry's foot. The leather toe of his shoe was ripped away but the steel safety toe-cap shielded his foot from any injury.

Another safety shoe was on a foot that needed it . . . at the right moment!

Pictures by courtesy of Diamond Alkali Company's "Alka-Lines."

by **WILLIAM A. ISAACSON**
Corporation Safety Director
L. A. Young Spring & Wire Corp.
Detroit, Mich.

Machining with

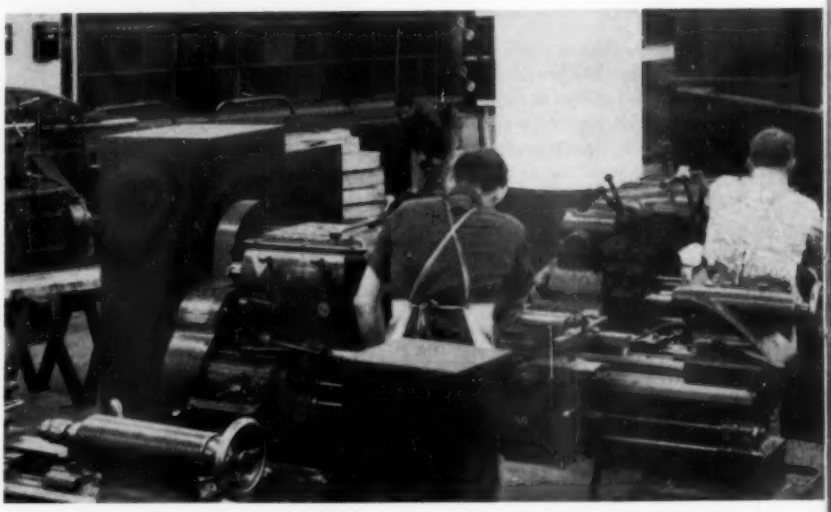
Metal machining can be defined as an operation performed most commonly by machine tools, in which metal is cold worked by progressively removing metal in the form of chips.

Injuries that result from the operation of these machine tools most often result from unsafe practices or because of incorrect procedures which are basically problems of training and supervision.

Types of Operations

Before going into the methods of accident prevention on machine tools, we should first explain some of the different types of operations and some of the most common causes of accidents on each. The National Association of Machine Tool Builders has classified some two hundred types of machine tools into five basic groups: I. Milling, II. Turning, III. Planing, IV. Grinding, V. Boring.

In the accompanying tables, here and on the following pages, we have briefly discussed the basic operations of machine tools and have also enumerated some of the most common causes of injuries in each group. In general, the three causes of accidents and injuries are unsafe conditions, unsafe acts, and unsafe attitudes.



Providing Safe Equipment

Probably the first step in eliminating unsafe conditions is providing safe design of our machine tools. In addition, safety in operations can be provided by:

Safeguarding the Point of Operation: The first consideration of this topic should be whether provision can be made to keep the operator's hands out of the danger area. This can be accomplished by providing mechanical loading devices where feasible. Guards or cages may be built around the point of operation or danger zones. Where mechanical loading devices are not feasible, provisions may be made so that the operator reaches into the machine only when the machine is completely stopped, or started only when the operator's hands are out of the danger zone. One method is the use of two-button controls, requiring the operator to depress two buttons or switches at the same time, one with each hand.

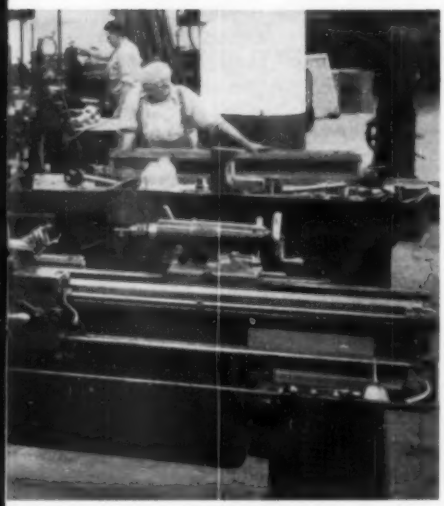
Guarding Moving Parts: Present day machines and equipment generally come equipped with sufficient guards on all moving parts. However, it may be necessary to insure that all necessary guards are provided.

Safeguarding Controls and Machine Mechanisms: Starting buttons or levers may be guarded in several ways to prevent the machine from being accidentally actuated by the operators or by falling objects. Another form of safeguarding controls may be to have certain guards hooked to the power source, so that the machine will not operate if the guard is not in the correct position.

Eliminating Unsafe Acts and Practices

Because most of the machine shop accidents are caused by the human element, it is necessary to train and supervise the operators constantly. Guards, controls, and design help to prevent accidents, but there is always that possibility of failure on the part of human

Metal Safety



beings to think and act safely. It is the responsibility of the Supervisors and Safety Representatives to train, instruct, and assist the employees under their jurisdiction to look ahead to avoid hazards.

Utilize Mechanical Safeguards: Mechanical guards are of no value if they are not in the proper position and adjustment when machinery is being operated. Repairs, oiling, and adjustments should be permitted only when the machine is turned off and adequate precautions taken so that the machine is locked or tagged.

Proper Care and Use of Hand Tools: Many of our accidents in

PLANING MACHINE ACCIDENTS

Planing operations are primarily intended for machining flat surfaces but can be arranged for machining many kinds of curved, odd, or irregular surfaces also.

Shapers, although generally classified as planing machines, differ slightly from the planer machines in that the work is fastened into a vise or fixture and the cutting tool is passed back and forth over the work. Planers work on the same principle, except that the cutting tool is held stationary and the work is mounted on a reciprocating table which passes under the tool or tools.

Other machine tools coming within this classification are slotters and broaches.

The most frequent causes of planer accidents appear to result from inadequate training and supervision. Bad practices include:

1. **The exposure of the hand or fingers between the tool and the metal being machined.**
2. **Allowing the hand to come in contact with sharp edges.**
3. **Obtaining measurements while the machine is in operation.**
4. **Failure to secure tool or clamp work prior to starting operation.**
5. **Riding the job.**
6. **Having insufficient clearance for the work.**
7. **Coming in contact with reversing dogs.**
8. **Failure on the part of the operator to insure that the current is turned on a magnetic chuck prior to operating.**

Broach operations may be safeguarded during normal operations by the use of supplementary controls. The most widely used safeguard for broaches is a standard, two-hand, constant pressure control. Also, an emergency shut-off device should be installed for the convenience of the operator.

GRINDING MACHINE ACCIDENTS

A grinding machine utilizes an abrasive wheel revolving at high speed to cut a piece of metal. The process may be internal grinding, external cylindrical grinding, or surface grinding, and includes such methods as polishing, buffing, and honing.

The abrasive grinding wheel is probably the most universally used power tool in all industry. Because of the wide and common usage of abrasive wheels and their frequent use under conditions where safety-minded supervision is lacking, frequent injuries result from this operation. Some of the causes of injuries on abrasive wheels include:

1. **Failure to use personal eye protection equipment.**
2. **Cleaning, adjusting or gauging work while the machine is in motion.**
3. **Wheels or transmission parts not properly guarded.**
4. **Applying wheel too quickly or taking too large a cut.**
5. **Excessive wheel speed or bursting of wheels.**
6. **Holding the work improperly or too high above wheel center line.**
7. **Requiring operator to reach across equipment to control switches.**
8. **Work rest not provided or incorrectly adjusted.**
9. **Wrong type of wheel or improperly mounted.**

BORING MACHINE ACCIDENTS

Boring operations consist of locating and finishing holes by means of drills, boring cutters, or reamers. The operations fall into two categories: Boring and drilling. Boring mills employ cutters, while drilling machines employ pointed or fluted cutting tools.

The most common causes of injury resulting from boring operations may be classified into two categories—"contact with," or "struck by."

1. **Hair or clothing coming in contact with revolving components.**
2. **Hands coming in contact with tool or spindle.**
3. **Struck by broken tools, cutters, or flying chips.**
4. **Struck by work not clamped securely.**

metal machining are caused by hand tools which are defective or used incorrectly, or used for purposes other than are intended. Hand tools should be made of the best materials to prevent them from breaking, cracking, or becoming dull quickly. It is imperative that hand tools receive constant maintenance.

Proper Clothing: Serious accidents can be prevented by proper dress. Loose clothing, ties, long sleeves, rings, etc., are easily caught in revolving machinery and should be prohibited in machine shops. Caps should be worn to cover long hair.

Requirement of Personal Protective Equipment: The use of personal protective equipment has prevented many serious accidents in a machine shop operation. Proper use of goggles, shields and helmets has prevented the flying chips, sparks, and broken tools from entering the eyes and face, thereby preventing serious injuries.

A Clean Place Is a Safe Place to Work: Good housekeeping is of prime interest in safety and should be constantly brought to the attention of the employees. Floors should be kept in good repair, clean and free of oil, grease and dirt. Tools, material, waste and oily rags all should be placed in the container provided. Everything should have a place and everything kept in its place.

Awareness of Hazards

Much has been done in safety to guard mechanical equipment and provide personal protective equipment, but there are situations that are always a potential hazard. An example is the sharp edge on a piece of metal or rotating parts that cannot be guarded. To prevent accidents in these situations, it becomes a problem of training and supervision. The employee must be instructed or trained that the steel should be handled with gloves or pads, that he must not reach into or across revolving parts until the machine is fully stopped.

Avoid Horseplay

Horseplay, fighting, and practical jokes cannot and should not be

tolerated in any phase of industry, particularly in machine shops. Many injuries have resulted from startled employees being forced into dangerous areas. It is well to remember that machine tools do not have the ability to think. A machine shop is not a jungle in which you endanger your life by merely entering and becoming exposed to massive metal animals, but rather a place where accidents may occur if common sense, good judgment, training, and supervision are not exercised.

From an address presented at the 44th National Safety Congress.

Navy Holds Fork-Truck Training Course

An 8-week training course stressing the safe and efficient operation of industrial trucks is being conducted at the Naval Aviation Supply Depot in Philadelphia. Sponsored by the Philadelphia Chamber of Commerce Safety Council in cooperation with the American Society of Safety Engineers and the Naval Depot, the course is planned to reduce accidents and increase production. Four of the newest type fork-lift trucks are being used in the training.

The Naval Depot, under the command of Rear Admiral John W. Crumpacker, SC, USN, provides classroom and obstacle course facilities one night a week for two hours. Instructions consist of classroom theory, films, demonstration and actual participation by students. All text and other material distributed at the classes is retained by the student.

Operators training, a four-week course of eight hours, includes a description of the course and equipment, discussions on palletization and handling of materials, explanations and demonstrations of the fork-lift truck, types of trucks and how they move, load distribution and mechanical features. There is also practice on stowing and handling material using spotting and placement section and aisleways.

Subjects covered in the course include: safety, management-employee problems, warehousing techniques and preventive maintenance.

MILLING MACHINE ACCIDENTS

Milling consists of machining a piece of metal by bringing it into contact with a rotating cutter with multiple cutting edges. The work is held on a table and fed past or into the cutter.

Statistics reveal that milling operations are generally low in accident frequency, but high in severity. About two thirds of the milling machine accidents occur when operators are unloading or attempt to make adjustments. Other causes of injuries experienced with use of this type of machinery include:

1. **Measuring or calipering the work when the machine is operating.**
2. **Using a rag to clean excess oil off the table while the cutter is turning.**
3. **Wearing gloves, ties, or loose clothing.**
4. **Failure to draw the job back to a safe distance when loading or unloading.**
5. **Adjusting the coolant flow while cutter is turning.**
6. **Using a jig or vise which prevents close adjustment of the guard.**
7. **Failure to clamp the work securely.**
8. **Leaving hand tools on the work table.**

TURNING MACHINE ACCIDENTS

Turning consists of shaping a rotating piece by means of a cutting tool, which is mounted on a carriage that provides infeed or cross-feed of the tool. Work is commonly rotated between centers or while held by a chuck, face plate, or fixture.

Some of the most common causes of injuries resulting from this type of operation are:

1. **Using calipers or gauge on the work while the machine is in operation.**
2. **Using the hand instead of a stick to hold emery cloth against the work or filing a rotating piece right-handed.**
3. **Flying metal chips or attempting to clean chips when machine is in operation.**
4. **Contact with projections on face plates, chucks, or lathe dogs.**
5. **Hand braking of the machine.**

A SAFETY IDEA

New Lighting System Aids Safety, Maintenance and Production

A new attack on the high-cost-of-doing-business has been reported by the Erickson Tool Company, manufacturer of precision holding devices for machine tools and automatic machinery in Solon, Ohio.

Erickson used a lighting system to help trim costs. When it moved into a new plant in mid-1957, the company installed a system using the new groove-type fluorescent lamps.

After six months of operation, the company was able to report the following gains directly traceable to lighting in the plant:

1) A production increase of 10 percent, even though many of the machine operators were newly-hired.
2) A 10 to 20 percent reduction in rejects in the grinding area where final finishing is done under tolerances of .0001 of an inch.
3) Complete elimination of errors due to misreading micrometers. In the old plant, this type of error accounted for 4 to 6 percent of all rejects.
4) A 50 percent reduction in minor accidents. The company has not had any serious accidents in its recent history.
5) A noticeable rise in worker morale. Worker complaints of headaches and eye fatigue due to lighting have disappeared completely.

Erickson lights its 20,000 square feet of manufacturing space with 230 fixtures, each containing two groove-type lamps. The fixtures are arranged in continuous rows ten feet apart and ten feet above the floor. Additional fixtures mounted crosswise between the regular rows at twelve-foot intervals have been installed in the grinding area, where tolerances are closer.

The lighting system was designed to provide 160 footcandles of light in the general work area and 200 footcandles in the grinding area. After 2,400 hours of operation, levels of 180 and 250 respectively are still maintained in these areas.

Formerly, the company used an overhead fluorescent system, plus additional fluorescent units mounted above each machine and supplementary incandescent units fastened to each machine. The time lost in adjusting and maintaining the supplementary lighting on the individual machines amounted to about ten minutes a day per man. Eliminating this lost time represents savings which more than pay for the cost of power needed to operate the new system.

Another advantage cited by William Steiner, assistant to the president, is the complete flexibility in machine location afforded by the new lighting system. Machines can be moved anywhere in the work area without having to re-arrange the lighting.

Erickson plans a further economy move with its new lighting system. Steiner said the group relamping and maintenance system —with all lamp replacement and cleaning being done at once—will be used. The relamping-cleaning will take place at the end of 18 months, according to the present schedule.

The company has carried its higher-level lighting program into its office area and drafting room. The lighting system delivers 125 footcandles in the offices and 250 footcandles in the drafting room. The grooved lamp is said to deliver three times more light than the ordinary fluorescent lamps.

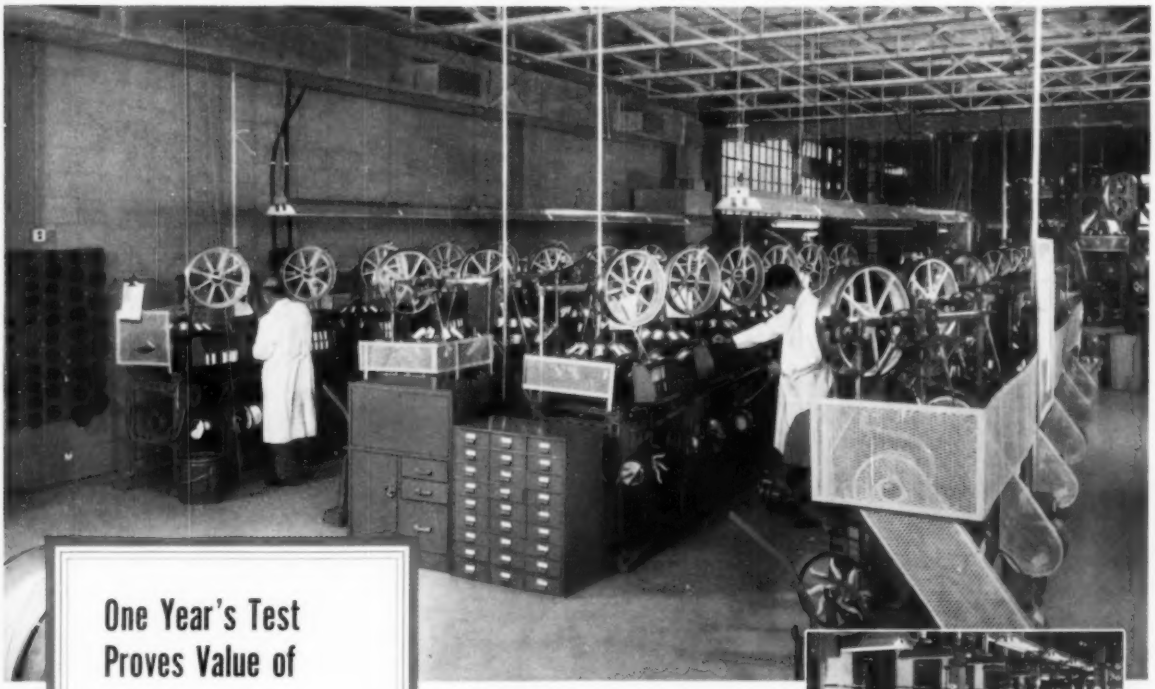
Picture by courtesy of General Electric Co.

Expecting Mail?

You'll get it quicker if your postal delivery zone number is on your order blanks, return envelopes, letterheads, etc.

The Post Office has divided 106 cities into postal delivery zones to speed mail delivery. Be sure to include zone number when writing to these cities; be sure to include *your* zone number in *your* return address—place it after the city, before the state.

For a copy of booklet described on opposite page, use Key # Q-6 on card on page 1.



One Year's Test Proves Value of Pittsburgh Color Dynamics® in Hitemp Wire Plant

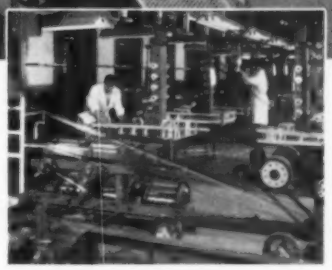
Modern painting system improves efficiency and morale so well it is used throughout specially designed new factory.

One year's test of Pittsburgh COLOR DYNAMICS proved so successful for Hitemp Wires, Inc., of Westbury, N. Y., that this modern system of painting has been used throughout its new 43,000 sq. ft. structure.

● **Hitemp Wires, Inc.,** has grown within seven years into one of the leading manufacturers of high temperature insulated wires and cables. Its products are sold to leading manufacturers of missiles, aircraft and electronic equipment.

● **How COLOR DYNAMICS has helped** to improve efficiency and morale in the Hitemp plant is best told in the words of George F. Rolfe, president: "About a year ago, our rapid growth required the leasing of temporary space. This presented an opportunity to try COLOR DYNAMICS. The results in efficiency, morale and safety for our workers proved so successful, we decided to adopt this painting system as standard throughout our new plant which was especially designed for our kind of production.

● **"Walls, ceilings and every piece** of machinery and equipment were painted according to this system. Moving into this new, efficiently designed structure has improved both volume and quality. While we believe the new facilities have contributed to this betterment, COLOR DYNAMICS has also proved to be an important factor.



● **"COLOR DYNAMICS** has made our new plant more pleasing to the eye, as well as aiding efficiency and morale. It has encouraged good housekeeping and cleanliness, a serious problem in our kind of plant because of the variety of miscellaneous small items used in processing wires and cables. We can heartily recommend this system of painting to industry as a key to improving efficiency, morale and general working conditions."

● **Why not test** the practical value of COLOR DYNAMICS in your plant? Try it on a machine or two, or in a complete department—and see the difference it makes.

Get This FREE Color Plan for Your Plant

• For a complete explanation of the way COLOR DYNAMICS can make your plant more efficient and safer, send for our free, comprehensively illustrated booklet. It tells you how to put color to work for best results. Better still, we'll gladly make a complete color study of your plant or any part of it without cost or obligation. Call your nearest Pittsburgh Plate Glass Company branch. Or mail this coupon.

Send for a Copy of this FREE Book

Pittsburgh Plate Glass Co., Paint Div., Department SM-58, Pittsburgh 22, Pa.

☐ Please send me a FREE copy of your booklet "COLOR DYNAMICS."

☐ Please have your representative call for a COLOR DYNAMICS survey without obligation on our part.

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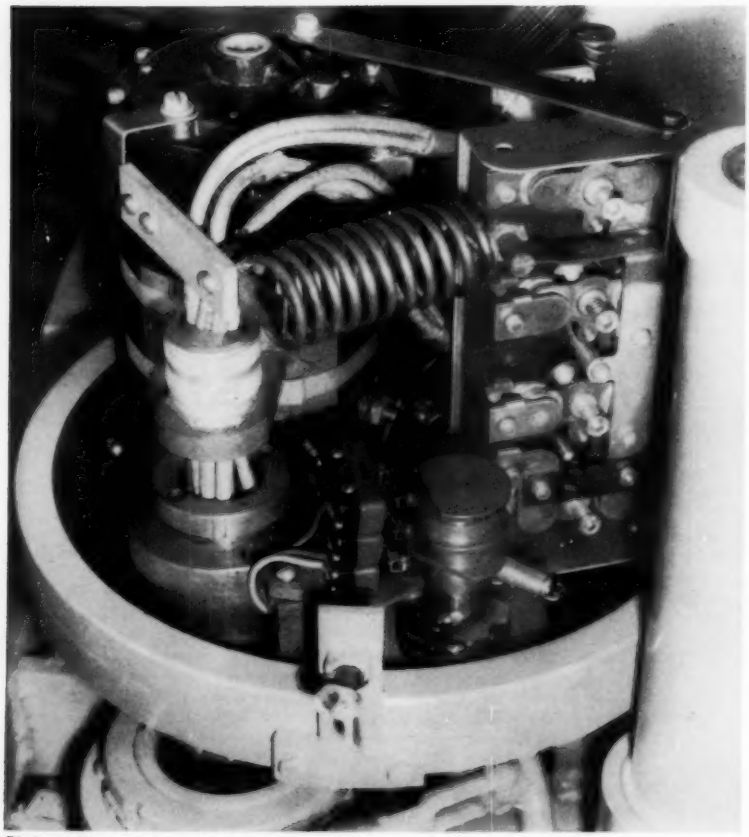
IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

by **WILLIAM BUSSE**
Marketing Manager
Revolvator Company

MATERIALS HANDLING SERIES
other articles June & July

how to maintain explosion-proof trucks



Picture 1:
Close-up view of interior of main housing of truck, showing contactors, circuit breakers, etc. whose normal operation may cause sparking. The screwed-down housing cover prevents sparks from reaching potentially explosive atmosphere.

Table 1: Hazardous Areas in which Explosion-Proof Trucks Are Used.

Class I, Group D: Atmospheres containing gasoline, hexane, naphtha, benzine, butane, propane, alcohols, acetone, benzol, laquer solvent vapors, or natural gas.

Class II, Group G: Atmospheres containing flour, starch, or grain dusts.

The National Fire Protection Association's "National Electrical Code" has defined various classes of explosion hazard and requirements have been established for the construction of powered equipment to be used in such areas. Requirements vary with the classification of the hazard. Obviously where dust and/or fumes in the air create an explosion hazard, sparks, whether in the form of an electric arc or from the exhaust of an internal combustion engine, cannot be permitted; and requirements will be more rigid where volatile fluids are open to the air than where they are handled in closed containers. However, some requirements are not necessarily so obvious. For example, surface temperature of parts which heat in operation must be 10°C lower in areas where dust may accumulate and become ignited than where fumes are the hazard.

Some hazards are so severe that no power operated industrial trucks may be used. However, in the relatively common hazards of fumes in a Class I Group D area or dust in a Class II Group G area, powered material handling equipment is increasingly being used. Such equipment may be a portable elevator, powered for lift but moved manually from place to place, or may be a fork lift truck fully powered for both lift and traction.

The "Standards for the Use, Maintenance and Operation of Industrial Trucks" published by NFPA states that the safety built into power operated industrial trucks must be maintained by the user. Equipment shall not be altered, parts removed, added or moved to positions different from

Picture 2:
Portable elevator truck, designed for Class I, Group D hazard areas, is here used for handling whiskey barrels. Note push button and electric motor enclosures and the drum-shaped housing above motor, containing electrical contactors, etc.

the manufacturer's design. Replacement parts shall duplicate original equipment.

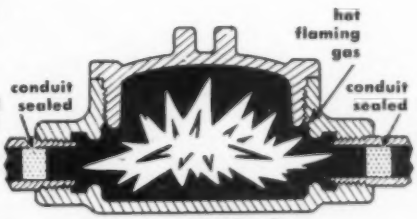
Since equipment operating in a hazardous area must not emit flames, sparks or hot gases, electrically powered equipment provides a power system which can be physically, mechanically and totally enclosed. Authorities agree that for Class I Group D hazardous areas the joints of such enclosures will permit the entry of explosive vapors but the strength of the enclosures must be such that they will contain any explosion occurring within and that the fit and length of the joints shall be such that flames and/or hot gases cannot escape. (See Drawing A.)

Of two methods commonly used for the construction of such joints, one (See Drawing B.) consists of accurately fitted faces clamped together by bolts. Gaskets might possibly blow out so these may not be used. Since safety of this type of construction depends upon the length of the faces, the accuracy of the fit and on all bolts being drawn up equally, special care should be taken in re-assembling after maintenance operations. Unequal tightening of one or more bolts might cause distortion and permit a gap in excess of that which would snuff out flames and/or cool hot gases. Therefore it is recommended that re-assembly of bolted joints be done with a torque wrench or similar device which would insure equal tightness of all the bolts involved.

A second common method of construction is to use accurately threaded parts with the screw of such dimensions that at least five full threads are engaged when the joint is closed. Many Engineers believe this threaded type joint is preferable in that the labyrinth path created by the threads (See Drawing C.) slows escaping gases for greater cooling. For maintenance the threaded joint offers the advantage that there are fewer parts to handle on disassembly or re-assembly and if such parts are firmly screwed together they are necessarily tight. Also checking the assembly is relatively simple and less time consuming than checking a number of bolts. Minimizing the opportunity for human error has obvious safety advantages. Locking threaded joint housings with a wire seal or similar device requires but one seal to a joint whereas a

CONSIDERATIONS IN THE DESIGN OF EQUIPMENT FOR USE IN EXPLOSION HAZARDOUS AREAS.

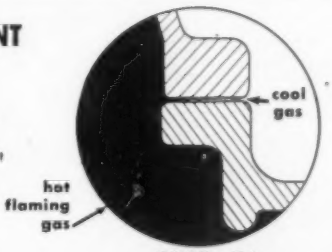
How combustion within an explosion-proof housing is contained by strong walls and accurately fitted joints which prevent flames and/or hot gases from escaping.



DWG. A*

GROUND JOINT OPENING

Accurately machined flanges of suitable length and fit prevent the escape of hot gases if properly bolted together.

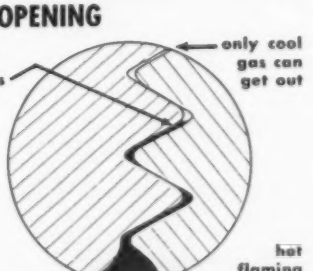


DWG. B*

THREADED JOINT OPENING

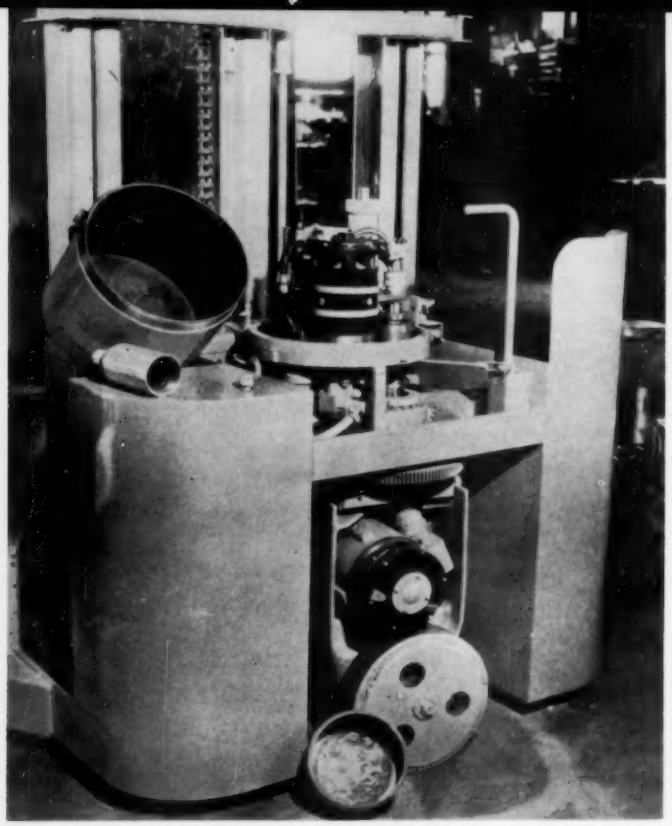
hot gas is cooled in passing through threads

Threaded joints provide a labyrinth path to snuff out flames and to cool gases and also are easily assembled.



DWG. C*

* — Drawings courtesy Crouse-Hinds Company



Picture 3:
Electric powered fork truck showing four screw-type enclosures, three of which (battery lead connector, traction motor housing, and main housing) have been opened for inspection. Housings designed for hazardous areas.

contactors, circuit breakers and similar electrical components. Leads to the traction motor housing from the main housing are carried through a woven metal flexible conduit approved for use in explosion hazardous areas. The junction box of the motor housing where this conduit enters is filled with an appropriate compound so that burning or explosion within either housing cannot be transmitted to the other. While it is unlikely that this compound need ever be touched, it must be replaced if it is ever disturbed.

Some Prefer Sheathing

Some users of industrial trucks in explosion hazardous areas prefer to have portions of such trucks sheathed with a non-ferrous material to prevent mechanical sparking in the event of collision with hard objects. Two common materials for this purpose are wood or brass sheet. Wood, of course, is impractical on such parts as forks because of the thickness required. Wood is subject to splintering and

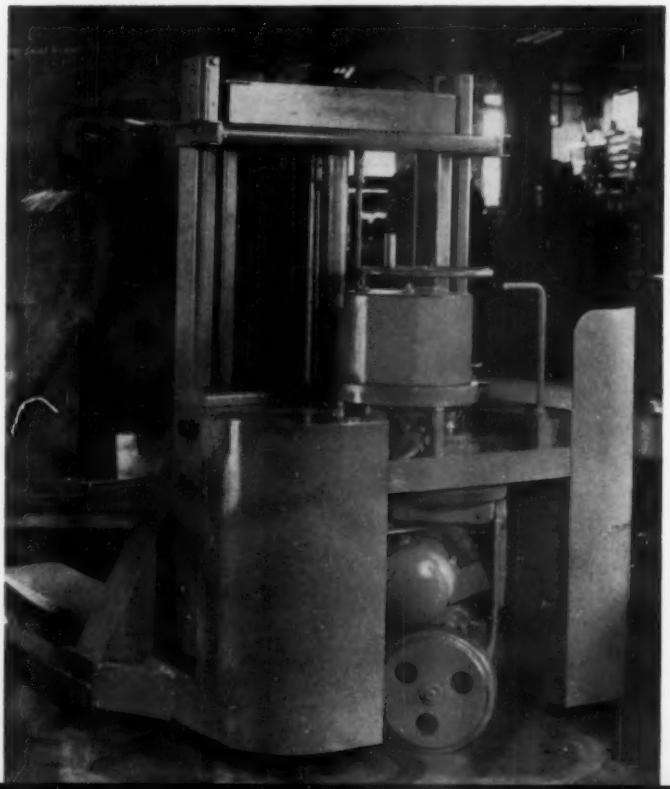
(Continued on page 34)

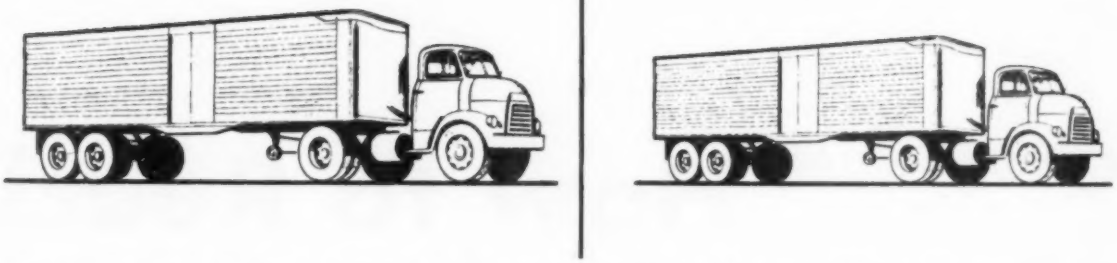
bolted fitted face type joint should have a seal on each bolt.

A Portable Elevator moved manually but powered for lifting will commonly use a motor in an explosion-proof housing as designed by the motor manufacturer. Necessary switches, contacts, etc. will be enclosed in a separate housing. (See Picture 1) Conduits, push buttons and similar components will be of suitable standard design. (See Picture 2) Maintenance operations therefore are standard for electrically powered equipment used in a hazardous area. Somewhat extra attention should be paid to periodic examination of swing and lead cables as compared with the same examination in non-hazardous areas.

Electric industrial lift trucks will have both traction and pump motors enclosed in special housings. On the electric truck shown in the Picture 3 the battery lead connector is enclosed in a special screw type housing which assembles directly to the main housing which contains pump motor, switches,

Picture 4:
The same truck with the explosion-proof housings in place. The battery cable connector cannot be seen since its mating half is behind the cowling.





WHICH TRUCK IS LARGER? In this black and white drawing, the one on the left is larger. But the point is that with scientific color treatment, two objects that were identical in size *could* be made to appear as different in size as these two drawings. Research findings reveal that color can definitely cause increases or decreases in the apparent size of surfaces by at least 13.5 percent.

Color and Highway Safety

NEW FLEET PAINTING PLANS BASED ON COLOR PERCEPTION

A new safety painting service developed especially for the bus and truck transportation industries and based on the company's Color Dynamics research findings has been announced by the Ditzler Color Division of Pittsburgh Plate Glass Company.

To be known as the "Ditzler Safety Series," the new color program is said to offer a unique aid to the truck and bus transportation industries.

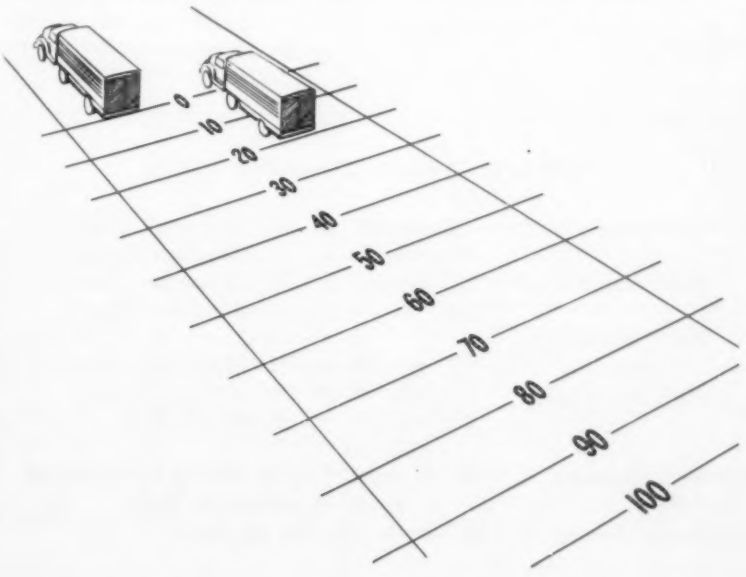
It utilizes high visibility color combinations to provide the greatest visibility directed at mobile equipment on the highways at all periods of the 24-hour day. Colors used include those with special advantage for recognition during daylight, dusk and nighttime driving conditions as well as colors possessing special properties for quick detection under foul weather driving conditions such as fog, sleet, snow and rain.

Color selections were based on the findings of the company's color research program in collaboration with The Johns Hopkins University Institute for Cooperative Research and the graduate psychology school of the University of Pittsburgh combined with color data from the company's research laboratory.

Visibility ratings on the colors were made visually by color experts under varying conditions. Selections were scientifically checked with a color Spectrophotometer.

The basic Safety Color Series offers a selection of 43 high visi-

(Continued on page 33)



IS THERE SPACE TO PASS? The truck on the right *looks* as if it were 19 percent closer than the one on the left. But appearances can be deceiving. A research project undertaken to determine the effects of color on apparent distance indicates that objects that are really side by side can be influenced by color to appear as far apart as the two trailer trucks shown here in black and white. The study shows that color can influence the apparent distance of a surface by as much as 19 percent. A bright red, for instance, appears nearly one-fifth closer than green. All bright surfaces appear closer than dark ones. In general, highly saturated colors tend to appear closer than pastel colors.

by **WILLIAM A. GERSTMYER, Supervisor**
Sanitation and Accident Prevention
American Sugar Refining Co.
Baltimore, Md.

How to Reach Sanitation

Our Sanitation Program is patterned after an efficient mechanical maintenance system and includes regular scheduled cleaning operations, scheduled inspections and area ratings, regular cleaning and maintenance of equipment including engineering control of production soil aimed toward the prevention of conditions of insanitation. It is diametrically opposite to the old concept of "clean it when it's dirty" and "repair it when it breaks down." With this program it is possible to maintain the entire plant including grounds up to predetermined standard sanitation levels at all times. This is most important as we are producing a food product and our customers and the general public quite rightly expect and receive the maximum degree of cleanliness.

The program utilizes trained personnel who employ standard cleaning methods and use standard equipment and supplies. It stresses participation from all employees within the plant, calling attention to the point that sanitation is everyone's job. Basically, it is an eight point program covering the following general headings:

1. Sanitation Organization.
2. Work Loads, Frequencies and Schedules.
3. Training—Standard Cleaning Methods.
4. Budgets and Standard Costs.
5. Personnel Participation.
6. Inspections and Ratings—Standard Sanitation Levels.
7. Engineering and Maintenance—Control of Production Soil.
8. Standard Equipment and Supplies.

Sanitation Organization

Sanitation Supervisor The sanitation organization is headed by a Sanitation Supervisor who coordinates the activities associated with the program at all five refineries and reports directly to the Vice President in Charge of Refinery Operations.

Sanitation Superintendent The refinery organization at each plant is headed by a Sanitation Superintendent who reports directly to the Refinery Manager. He is responsible for the over-all administration and operation of the program including: preparation of budgets, work loads, cleaning schedules, changes in work loads or schedules, training of all cleaning personnel in standard cleaning methods, sanitation painting, plant inspections and ratings. He is also held responsible for sanitation costs including variances from sanitation work standards.

Sanitation Zone Foremen The plant, dependent upon size, is divided into zones and each zone is covered by a Sanitation Foreman who works directly under the Sanitation Superintendent. These men direct the supervision of the sanitation group cleaners, general cleaners, and painters who may be assigned to work in their respective zones. They also make daily inspection tours of the departments and areas included in their zone and call unsatisfactory conditions to the attention of Departmental

TABLE 1: TYPICAL CLEANING RATES

Sweeping Floor	— 12 min/M sq. ft.	(Average Floor)
	10 min/M sq. ft.	(Modern Floor)
Wet Mopping	— 30 min/M sq. ft.	(Average Floor)
	24 min/M sq. ft.	(Modern Floor)
Wet Mopping Stairways	— 40 min/M sq. ft.	(Average Floor)
Wall Washing	— 75 min/M sq. ft.	(Smooth Wall)
	120 min/M sq. ft.	(Brick Wall Painted)
Wall Dusting	—12–15 min/M sq. ft.	(Using 10 inch dust mop on extension pole)
Power Sweeping—48" path—40,000 sq. ft./hr.		

BUILDING MAINTENANCE SERIES
other articles April & June

Your Goals

Supervisors or the Engineering Department for correction and report findings to the Sanitation Superintendent.

The employees supervised by the zone foreman perform the following operations:

Maintain wash rooms and lavatories.

Clean offices, locker rooms, cafeterias, stairwells, dust and wash equipment, walls, columns, ceilings, lights and windows.

Operate power equipment, such as: power sweepers, automatic-scrubbers, steam cleaners, hot-spray units, power vacuums, and floor machines for buffing and stripping.

Prepare areas and equipment for painting. Paint interior areas and equipment.

Departmental Superintendents and Foremen—Operations The departmental superintendents and foremen are directly responsible for cleanliness and maintenance of standard sanitation levels which are assigned to the areas and sections of their departments.

The supervision of departmental cleaners, area cleaners, operator cleaning and production cleaning which is set up on regular schedules rests in the separate departments. The cleaning of equipment, interiors of tanks, conveyors, etc., is also a departmental function.

Work Loads, Frequencies, and Schedules

Work standards for sanitation cleaning have been established for all sanitation cleaning jobs. These have been developed using time studies and other industrial engineering methods. Standard cleaning methods have been worked out employing standard equipment and supplies. In addition the required frequency for cleaning each area has been determined and definite cleaning schedules have been established. The work standards and schedules provide controls for maintaining established sanitation levels at minimum cost. A work standards program specifies what is to be cleaned, how it is to be cleaned and the frequency of cleaning, and the standard controls measure the efficiency of the cleaning procedure.

The determination of work loads is one of the first and most basic steps in setting up and maintaining our sanitation program. Without knowing how much cleaning has to be done, no program can be efficiently operated or intelligently controlled. Only a thorough knowledge of the amount of necessary work can provide the information for knowing:

a) How many sanitation workers are needed.

b) How to make up and distribute fair and equal work schedules.

c) How to arrive at productivity.

TABLE 2: INSPECTION RATINGS

Location	Cleanliness	Order	Engineering & Maint.	Insects & Rodents	Total Possible Score
Floors	16	4	5	3	28
Equipment	20	2	10	3	35
Walls	10	1	5	2	18
Ceilings	4	—	3	1	8
Windows	2	1	2	1	6
Lighting Fixtures	2	—	2	1	5
	54	8	27	11	100

d) How to compare costs.

e) What should be done for the attainment of improvements.

The following factors are taken into consideration in all work load determinations.

1) The sanitation level to be maintained. If a high level is established, more scrubbing or washing rather than dusting is necessary, and all cleaning jobs must be performed more frequently.

2) Conditions in the area. The rate and degree of soil deposition (production soil, spillage etc.), the age and repair and finish of various surfaces and the degree of obstruction and traffic problems (when an area can be most economically and safely maintained).

3) Standard cleaning methods at established rates, using standard tools and cleaning equipment.

4) Availability of cleaning tools and their location for use in the area.

5) Possibilities of controlling or eliminating production soil by engineering.

6) The effectiveness and amount of available supervision.

In this system all of the areas in the plant are broken down into integral areas and an inventory is taken of all units that require cleaning. Such units include machinery, motors, tanks, piping, desks, tables, chairs, walls, windows, ceilings, lights, and floors, etc.

After listing the description of the units on a prepared form the standard cleaning operation is chosen and indicated for each unit on a daily, weekly, monthly, or annual frequency as the case may be. The selected cleaning procedure and frequency depend upon the standard sanitation level that is set for the area. For example, in a shipping area where the desired standard probably would be a 75 (100 is perfect) there would be no polishing, very little complete dusting and little horizontal dusting of equipment or stock; here we would concentrate on power sweeping the floors on a continuous daily operation and autoscrubbing weekly all open areas. If the same area required a level of say 85, more dusting of both types would be necessary along with increased wet cleaning of both floors and equipment. In offices, some complete dusting is scheduled every day, with one-fifth of the equipment dusted daily in a five day work week so that by the end of the week the entire area is serviced.

The cleaning rates used in our plants were based on the performance of average employees with normal supervision and include make-ready, personal, transportation, and put away times. Table 1, p. 24, shows some of the rates.

The next step, daily routine scheduling, is given considerable study and observation. The daily work load including area cleaning and janitorial cleaning is divided between Departmental Cleaners and Sanitation Cleaners, and the project work, such as equipment cleaning, overhead pipelines, walls, and lights is assigned to the General Cleaning group. In addition each operator, station man, and production worker is expected to keep his immediate work area as tidy as possible.

Training—Standard Cleaning Methods

The training of the cleaning workers in the proper application of standard cleaning methods is the responsibility of the sanitation staff. This applies to all types of cleaning within the plants and includes departmental cleaners who under normal conditions are supervised by the departmental foremen. We have found that proper training and constant follow-up in the correct use of tools and methods assures greater efficiency.

Training sessions are also held from time to time for foremen. At the start of this program, all foremen and supervisors attended such a training session and were given a specially prepared Cleaning Manual containing the standard clean-

TABLE 3: STANDARD RATINGS BY AREA

Areas	Standard
Offices	80–90
Finished Product and Packaging Areas	85–90
Manufacturing Areas (Raw Materials)	70–80
Manufacturing Areas (Process)	75–85
Storage Areas	70–80
Lavatories and Locker Rooms	85–90
Warehousing and Shipping	75–85
Cafeterias	85–90

ing methods used in the various areas of the refinery and offices.

The Sanitation Department operates under a cost control mechanism based upon standard work loads and frequencies so that efficiency of cleaning workers may be readily checked. Each variance as it occurs pin points items that need correction, whether it be an engineering deficiency, an incorrect work load, poor supervision or inefficient procedure.

The sanitation superintendent and his staff are responsible for standard performance of the cleaning workers under their supervision from both a man-hour and efficiency standpoint. Also included as their responsibility are:

1. **Preparation of the annual sanitation labor budgets.**
2. **Preparation and administration of daily work sheets and schedules for general cleaners on project work.**
3. **Administering controls and explanation of variances.**

Variance reports are prepared on a regular weekly basis and variances as they occur are explained by the department head or the sanitation superintendent. At the end of each month, these variances are summarized on a dollar basis for inclusion in a regular report covering controllable sanitation costs and variances. Thus the sanitation staff can keep its finger on costs and variances covering all plant cleaning operations.

The purpose of this part of our program is to:

a) Develop sanitation "consciousness" and responsibility at all plant levels: management, staff, supervisory, and operating employees. This consciousness represents an awareness of the need for and desire to do something about cleanliness and order.

b) Translate this consciousness into defined channels of action so that everyone will do his part in helping keep the plant clean.

We know full well that no food plant can be maintained at satisfactory sanitation levels without the help of all of its employees. No matter how large or efficient the regular cleaning force, soil and spillage deposited in the normal course of production will, unless quickly removed, bring the level down. Unless each employee makes every effort to avoid creating soil and to maintain his immediate area, the plant will never remain clean during production hours. For this reason we stress the importance of personnel participation and have selected a member of the Personnel Department staff to coordinate this phase of the sanitation program. The function of the coordinator is primarily to maintain the momentum of the program, distribute educational and promotional material and work with the sanitation staff with the aim of keeping up the interest of the employees in sanitation.

TABLE 4: CLEANING EQUIPMENT AND SUPPLIES

Floor machine—19 inch (disc type) and accessories.
Insecticide fogger.
Floor sander—belt type.
Edging tool—disc.
Scarifier, hand type.
Scarifier, drum type.
Automatic vacuum-scrubber—36 inch path.
Steam mixer.
Steam cleaner.
Manual sweepers—20 inch and 26 inch paths.
Power sweepers—48 inch and 53 inch paths.
Wet and dry pick-up—vacuum machines.
Vacuum heads for use on steel drums.
Hot-spray washing units.

Our standard supplies list includes materials such as the following:

Non-ionic synthetic detergent.
Chloramine—T disinfectant and deodorant.
Hexachloraphene brand soap.
Resin emulsion floor finisher.
Chlorinated rubber and epoxy resin concrete seals.
Lindane (0.5%)—Methoxychlor (3%) (residual).
Pyrethrum Spray (1.5 P.B., .3 Pyronones).

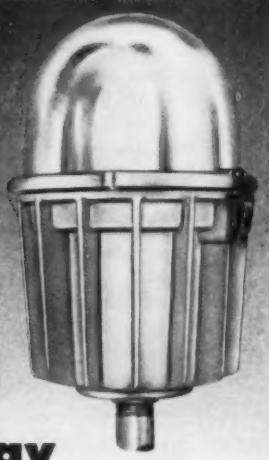
Inspections and Ratings—Standard Sanitation Levels

Regular inspections and ratings by departments and areas are made at each plant during the course of the year. The practice is to have an outside inspection and rating made every four months. Daily inspections are made by the sanitation zone foremen. Spot ratings are made monthly and the entire plant is rated bi-monthly by the sanitation superintendent.

We use in our rating procedure a numerical system, which we have developed for our program in collaboration with Industrial Sanitation Counselors of Louisville, Kentucky. In this system, floors, equipment, walls, ceilings, windows, and lighting fixtures including panels and switch boxes are scored as to cleanliness, order, engineering and maintenance, and insects and rodents. The breakdown of the possible total score of 100 as set-up in this system is shown in Table 2 on page 26.

The sanitation rating is an objective measurement of the end result of the sanitation effort and as can be seen by the chart is based on a score of 100 as perfection. The rating plan aids the sanitation staff in the detection of poor conditions before they can become serious, but most important it provides an effective tool in securing plant-wide interest and participation of all employees in the sanitation effort. The standards are set by agreement between the plant Sanitation Superintendent and the respective department heads and are submitted to the Refinery Manager

NEWEST and Finest Industrial Beacon Ray Warning Light



Where you need a warning you need the best warning

The adaptability and success of the model 27S Beacon Ray created demand for an even more powerful and more rugged warning light. The new MASTER Beacon Ray model 271 more than doubles the intensity and range of prior designs. It can mount on a 1" pipe or on a flat surface. It has a substantial cast aluminum housing and a heat resistant glass dome which houses a mechanism that rotates a single, powerful sealed-beam spot lamp. The hinged cover with single clasp, facilitates relamping and inspection. The MASTER model 271 Beacon Ray is built for real service and full dependability! The only revolving warning light with adjustable tilt-beam feature. Write for bulletin on new MASTER Beacon Ray model 271 light today.

FEDERAL SIGN and SIGNAL Corporation 8731 So. State St., Chicago 19, Ill.

(For details, use Key # Q-11 on card on page 1)

for approval. The standard sanitation level for any given area is based on the type of work carried on in the area.

Typical standards which we have set for some of the areas in our plants are in the ranges shown in Table 3, on page 26.

In order to maintain interest in the program, awards are given for outstanding sanitation performance. One award is presented to the refinery showing the best net sanitation performance on the basis of outside ratings. Net performance is the plant standard minus the actual rating.

Another award goes to the department showing the highest net sanitation performance as determined by the difference between the department's standard and actual ratings. A third award is presented to the department showing the greatest progress since the last rating.

Engineering and Maintenance—Control of Production Soil

Top management recognizes the fact that an efficient sanitation program cannot be attained without good engineering design and maintenance directed toward the control and elimination of production soil. We have established a program which recognizes the engineering work required for good sanitation. However, when repairs or maintenance work not covered by the engineering maintenance program become necessary, the work is called to the attention of the Engineering Department by the use of an engineering work order system. The work usually is initiated by one of the departmental supervisors assigned to the area in which the work is requested.

In order to speed the work orders on sanitation engineering, we have developed a Sanitation Memo-Control of Soil form, for the specific use of the sanitation staff. It is a tool for calling attention to sanitation problems which go unnoticed by department heads or foremen. It is not the intent for this staff to write engineering work orders, but merely to jog the thinking of departmental supervisors in order to keep them sanitation conscious. The procedural forms are in duplicate and in two colors, the original going to the departmental superintendent and the copy to the sanitation office for follow-up.

The sanitation engineering design aspects of all new installations are reviewed by the Sanitation Superintendent before they are submitted to the central office for approval.

The Sanitation Supervisor plans and coordinates this controlled engineering program; makes regular visits to all of the company plants; submits reports covering the status of the engineering programs and works closely with the Engineering Departments at each plant on all new construction projects where sanitation engineering is involved.

Standard Equipment and Supplies

A standard equipment and supplies list completes our controlled sanitation program. Without a full complement of tested tools, equipment, and cleaning supplies, the

cleaner's output is limited and his value considerably diminished.

Additions to or deletions from this standard list are made only after the products have been tested within our plants on the basis of on-job tests.

We believe our standard equipment consists of the best tools that are available for the purpose for which they were designed and all have been tested in the course of research connected with the program.

As a matter of information, we include in Table 4, on page 27, mechanical and power driven equipment on our standard equipment list. All of these materials have been especially selected to accomplish our specific cleaning or sanitizing jobs.

From an address presented at the 9th Plant Maintenance & Engineering Conference. Picture by courtesy of Association of American Soap & Glycerine Producers, Inc.

President's Conference on Occupational Safety

President Eisenhower spoke to 3,000 delegates convening in Washington at his invitation on the opening day of the President's Conference on Occupational Safety late in March.

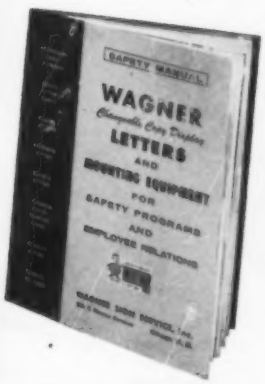
The President's participation completed the program for the Tenth Anniversary Conference which also included more than 80 representatives of business, labor, education, and government who led discussions during the three-day session. Most of these 80 individuals took part in eight "Workshops" or panel discussions, on various approaches to improved occupational safety. Their subjects were selected to implement the Conference Theme, "Safety Conserves Manpower . . . Manpower Builds the Future."

They included discussions of the safety aspects of increasingly widespread use of the atom in industry, by a panel of experts headed by Vice Admiral W. A. Kitts, III, of General Electric; of motivation research into basic psychological factors of safety, led by Dr. Harry Levinson, of the Menninger Foundation; and safety training for the future in school shops and laboratories, under Dr. John P. Walsh, of the U. S. Office of Education.

Other sessions covered off-the-job safety, moderated by J. Sharp Queener, of duPont; expanding safety activities through organizations, headed by H. F. Reinhard, Union Carbide Corporation; State promotion of safety, under Ernest B. Webb, Director of the California State Industrial Relations Department; medical contributions to safety, moderated by Dr. Leo Wade, Medical Director for Esso Standard Oil; and the function of improved use of records and analysis, under Ewan Clague, Commissioner of the Labor Department's Bureau of Labor Statistics.

Featured speakers were AFL-CIO President George Meany; General Electric Company President Ralph Cordiner; and Benjamin Fairless, President of the American Iron and Steel Institute.

"If I were a Safety Engineer I'd consider this brochure priceless"



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- **What are the vapor hazards of flammable liquids . . . what fire prevention containers and equipment will do exactly the right job?**
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FEDERAL EMPLOYERS' LIABILITY ACT
—Injury While Lifting Switchrod—
Instructions

Where an employee was injured after having lifted a switchrod in the course of his employment, the could held that there was sufficient evidence that the number of men required to do the job was not enough, that a safe place to work had not been provided, and that the foreman had issued a peremptory command ordering the employee to pick up the switchrod which he knew or should have known would cause injury, to support the jury's verdict for the employee. The court held that the jury was the fact finding body, and that the court has no right to reweigh the evidence even though it was sufficient to support a different verdict. The court further held that the verdict was not excessive or the result of prejudice, since the evidence was sufficient to sustain an even larger verdict. The court rejected the employer's contentions that it was not liable since the employee had received a rule book which stated that the work must always be pursued in a safe manner, and that the court committed error in the instructions which it gave to the jury, and in its refusal to give some of the employer's instructions. The court stated that the employee had no choice in the manner of performing his work. Affirmed.

Kansas City Southern Railway Co. v. Haynes; Oklahoma Supreme Court. No. 37, 343. December 10, 1957.

ARISING OUT OF EMPLOYMENT—Heat
Exhaustion and Heart Condition

An award of the commission, granting a construction worker temporary total disability compensation for heat exhaustion sustained in the course of his employment, was held to be supported by substantial evidence. The claimant, on the day the injury through heat exhaustion was alleged to have occurred, had been engaged in digging a foundation in 110 degree heat. He became dizzy, experiencing, at the same time, pain in his chest; subsequent to this the claimant was hospitalized for three weeks. In determining the claimant to have sustained an accidental injury within the course of his employment, the court stated that where the employee's work by reason of its location, nature and climatic condition was likely to expose him to the danger of heat exhaustion, as distinguished from the ordinary risk to which the general public would have been exposed from like climatic conditions, the employer was responsible for the resulting injury.

Virgil Graham Construction Co. v. Nelson; Oklahoma Supreme Court. No. 37, 708. Feb. 11, 1958.

HAND INJURIES—Statutes Construed
—Cement Poisoning

An employee was properly awarded compensation on the basis of an accidental injury where he became disabled due to cement poisoning to his hands after having handled cement in the course of his employment. The court stated that "accidental" within the meaning of the statute includes an injury resulting from the cumulative effect of trauma, or casualty, occurring at different times and over an extended period. The court further held that the evidence sustained the finding that the disability of the employee was caused by an accidental injury resulting in cement poisoning. Affirmed.

Public Service Co. v. Gillespie; Oklahoma Supreme Court. No. 37, 766. January 28, 1958.

Safety Seminar Graduation

Graduation ceremonies were recently held in New York for safety, operating and personnel representatives of 17 companies who had completed two weeks of intensive study in public utility safety at the Seminar on Public Utility Safety. Jointly conducted by Ebasco Services Inc. and New York University Center for Safety Education, the seminar stressed the study of mod-

ern practices and techniques in accident prevention administration.

Most of the course was devoted to lectures covering such subjects as human relations, supervision, safety training, motor vehicle safety, fire prevention and protection, utility safety programs and effective speaking. These lectures were presented by educators at New York University and Ebasco safety representatives.

Now in its 11th year, the seminar was developed to provide a course in safety administration and technique. It has proved to be so effective that many companies now include it as part of their management development programs.

Navy Makes Safety Shoes Mandatory

It's always "safety first" with the Navy's Bureau of Supplies and Accounts, which believes that an aggressive foot and toe protection program is as important as sight, hearing and other programs for protecting personnel against occupational injuries or diseases.

To safeguard employees against foot injuries, the Bureau has issued an instruction which requires all military and civilian personnel engaged in foot hazardous trades and occupations to wear protective foot-gear. This new requirement covers employees engaged in construction, materials handling, maintenance, transportation, ship and aircraft overhaul and repair, explosive manufacturing and handling, warehousing, packaging and preservation, stevedoring, and ordnance repair.

The types of foot protection emphasized in the instruction are safety shoes with built in protective box toe, toe guards worn over regular shoes, and special safety footwear. Special footwear includes safety shoes used to dissipate static electricity, Molder's "Congress" style safety shoes used to protect workers using molten metal, electrical hazards shoes, and rubber or synthetic material safety boots used against acids and other chemical hazards.

All Naval activities affected by the new requirement will appoint a committee to survey areas and occupations which are potentially hazardous to the foot and will take necessary action to carry out the accident prevention program.

Color & Highway Safety

(from page 23)

bility paint colors providing an innumerable range of two-tone color arrangements that combine all the better features of safety, high-visibility, appearance and durability.

In determining color selections for commercial vehicles, the color experts selected from the standpoint of the effects of light on various colors.

Reflectance considerations included geographical and seasonal locations and conditions; prevailing light conditions during highway use; and the background against which the vehicles are run.

The effects of color on apparent distance were determined on the basis of findings of a research project at the Psychological Laboratory of The Johns Hopkins University Institute for Cooperative Research.

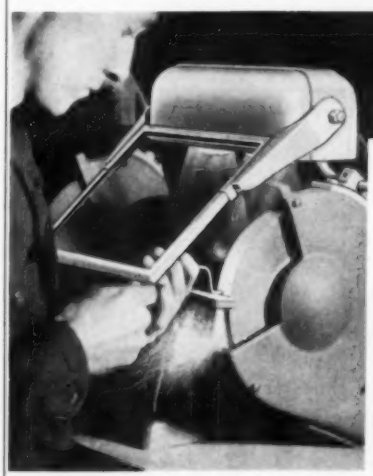
In this investigation it was demonstrated that color does influence the apparent distance of a surface. The experiment shows that a bright surface appears closer than a dark one with a maximum average change in apparent distances of about 17 percent.

As much as 19 percent change in apparent distance can be attributed to hue changes for saturated hues or deep colors. Less saturated hues—pastel colors—show the same effects but to a lesser degree.

Hues of longer dominant wavelengths appear closer than hues of shorter dominant wavelength. In general, highly saturated colors tend to appear closer than colors of low saturation.

Color and Size

That color is a tool for increasing or decreasing apparent size



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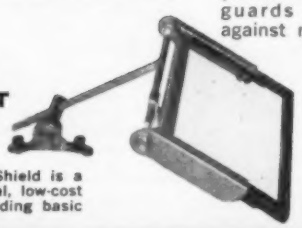

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(For details, use Key # Q-9 on card on page 1)

has long been known but refining this knowledge for practical applications has been limited until the completion of another research project. In this study it was conclusively demonstrated that color can definitely cause increases or decreases in the apparent size of surfaces by at least 13.5 percent.

The study reveals conclusive percentages in size changes based on carefully controlled color comparison tests. These effects are not simply related to color, that is, we cannot say that "red" can make a given surface look larger and "blue" can make it look smaller. We must state which red and which blue we are referring to. We can say that, in general, the longer the wave length of a colored surface, the higher its value, and the greater its chroma, the larger it will appear.

Results of the investigation revealed that hue (the quality that distinguishes one color from another such as red from blue) changes alone can effect at least a 9.5 percent change in the apparent size of a surface. Brightness or value changes alone can bring about at least an 8.5 percent change in apparent size while chroma or saturation changes alone can affect apparent size by at least 6 percent.

Effect of Combination

A combination of the three basic color dimensions producing an effect in the same direction can cause an increase in apparent size of at least 13.5 percent.

Inasmuch as the apparent size and distance factors are the primary safety considerations in mobile equipment perception on the nation's highways, the color experts gave primary consideration to these in selecting colors for the safety series.

The Ditzler Safety Series is believed to be the first and only safety color aid to be offered to the transportation industry by a major paint company.

In addition to the safety factors in the new colors, the service provides a color properties guide for special durability requirements. The Safety Color Series book will be made available for presentation and discussion to trucking and transportation associations as well as individual companies on request.

Details on the Safety Color Series may be had by writing Ditzler Color Division, Pittsburgh Plate Glass Company, 8000 W. Chicago Avenue, Detroit 4, Michigan.

Explosion-Proof Trucks

(from page 22)

thin metal sheeting to tearing, either of which may result in jagged edges dangerous to personnel.

One large company has sheathed a fork truck with one of the fibre plastic materials and reports that it stands up well. Tip ends of forks wear but this point has the additional protection of a brass tip. Available in various thicknesses depending upon the use required, sheets are cut with knife or scissors to size for the area to be covered and soaked in a liquid activizer until soft and pliable. Applied to clean steel surfaces and smoothed down to eliminate air bubbles the material will adhere firmly to the steel when it dries. Repairs are readily made by applying a patch over the damaged area. This ma-material should eliminate the daners to personnel possible from wood splinters or torn sheet metal; but like either of those materials it should be inspected frequently and any damage repaired immediately to avoid leaving exposed steel surfaces if the user feels this is important in his operation.

Repairs of any nature on any powered material handling equipment should be done in a non-hazardous area as must fueling of internal combustion engine types or battery charging of electrical types.

Drawings by courtesy of Crouse-Hinds Co.; photographs from Revolvator Co.

SAFETY FACTS for Industry
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(For details, use Key # Q-10 on card on page 1)

Construction Fires

Careless use of temporary heating devices, careless welding and careless smoking cause more than half the fires which cost the construction industry millions of dollars in losses annually. This is the conclusion of a new analysis of fires in buildings under construction just released by the National Fire Protection Association. The NFPA report, published as Fire Record Bulletin FR 58-1, includes a 10-point program for the prevention of such fires.

First in the list of causes is the salamander used at construction sites to keep the chill off both work and workers. Set up too close to a tarpaulin or accidentally knocked over, it can start a blaze which may quickly spread to construction materials commonly stacked close at hand.

Second most common cause is the use of welding and cutting torches without proper protection of nearby combustible materials. Following closely is careless smoking and disposal of matches.

Among the construction fires cited are a half-dozen 1957 blazes in the U. S. and Canada which collectively caused almost $1.6 million worth of damage. Largest of the past decade was the $2.5 million fire in the partially-completed Army Tank Factory at Livonia, Mich. in 1952, which reportedly started from a salamander in a construction shanty. A carelessly discarded cigarette cost an ultimate $1.2 million in fire loss during the 1955 construction of a hospital addition in Pittsburgh, Penna.

According to the NFPA report, what turns little fires into big destructive ones is frequently the storage of combustible construction materials too near the spot where fire-hazardous operations are going on.

The new 16-page illustrated bulletin is the 32nd in NFPA's continuing series of occupancy fire records. They may be obtained at 50 cents per copy from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

February Losses Rise

Estimated fire losses in the United States during February amounted to $103,853,000, the National Board of Fire Underwriters has reported. This loss represents an increase of 8.7 percent over losses of $95,569,000 reported for February, 1957, and an increase of 3.9 percent over losses of $99,918,000 for last January (1958).

Losses for the first two months of 1958 now total $203,771,000, a decrease of 3.4 percent from the first two months of 1957, when they amounted to $210,841,000. These estimated losses include an allowance for uninsured and unreported losses.

Fire Hazards of Jet Aircraft Fuels

The introduction of the jet engine to the field of aircraft propulsion has brought about an entirely new set of fuel requirements, warns a recent bulletin of the National Board of Fire Underwriters. Initially only the military used jet engines, but now commercial airliners using turboprop and turbojet engines are in service and the use of jet fuels will become increasingly common.

Basically, jet fuels are hydrocarbon mixtures derived from petroleum and are products similar to kerosene and gasoline. In fact the first jet engines utilized a fuel known as JP-1 that was essentially kerosene. It was quickly recognized that large numbers of jet aircraft operating under wartime conditions would use considerably more JP-1 fuel than could be produced by existing refinery equipment. As a result during the following years intense effort was devoted to developing other jet fuels which would give satisfactory performance and would also be available in the necessary quantity. Improvements in jet engines and changes in fuel performance requirements have also resulted in gradual changes in fuel specifications.

Like most other petroleum products, jet fuels are mixtures of a large number of hydrocarbon compounds. Aviation gasoline may contain as many as 300 separate hydrocarbons while some of the jet fuels, for example, may contain five to ten thousand individual compounds.

Because jet fuels are such mixtures and because they are selected to be available in maximum quantities, their properties can vary—particularly those properties which do not directly affect their use in aircraft. For this reason separate batches of fuel may show differing values of flash point or ignition temperatures.

All the jet fuels have ignition temperatures which are among the lowest found for hydrocarbons and are considerably lower than those for aviation gasoline which are on the order of 850 to 900 F.

Types of Jet Fuels

JP-1, the original jet fuel, is a kerosene-type fuel having a minimum flash point, according to military specifications, of 110 F. This is also the legal minimum for kerosene in many states. The ignition temperature of typical samples of JP-1 is about 480 F. This fuel finds only limited use today.

JP-5, a special fuel produced for Navy use aboard aircraft carriers,

also is of the kerosene type; but specifications call for a higher flash point of 140 F. Tests on representative samples have shown flash point variations from 125 to 159 F with an average value of 147 F. JP-5 has an ignition temperature of about 475 F. This fuel has very little tendency to volatilize at sea level pressures and normal atmospheric temperatures. Under such conditions, from the fire safety viewpoint, it is the least hazardous of the jet fuels currently utilized. In use, however, two or three parts by volume of JP-5 are blended with one part of aviation gasoline. This blend has a low flash point comparable to gasoline alone and has essentially the same fire hazard.

JP-3 is a blend of kerosene and gasoline which was developed to provide greater availability from crude oil than was possible with JP-1. Specifications for JP-3 do not set any minimum value for the flash point and figures ranging from −10 to −40 F have been reported. Values of ignition temperatures have been given as on the order of 485 to 500 F.

JP-4 was developed to replace JP-1 and JP-3. Like JP-3, it is a blend of gasoline and kerosene but is of lower volatility than JP-3. Today JP-4 is the primary military fuel for turbojet engines. Present military specifications do not set any requirements for minimum flash point, but values ranging from 30 down to −10 F have been reported. Ignition temperatures from 485 to 625 F have also been given.

Air-Fuel Mixtures

Considering fire hazard alone, JP-4, because of its lower volatility and somewhat higher flash point theoretically has some advantage over aviation gasoline, but this advantage is generally so slight as to be negligible in practice. JP-4 also should be handled with the same precautions accorded gasoline.

These fuels, like other liquid fuels, will not burn as liquids. They must be vaporized, or atomized to a spray, and must be mixed with the proper amount of air to form a flammable mixture. When confined, as in a storage tank, these fuels will form explosive mixtures between certain temperature limits. If held at temperatures below these limits, too little vaporization takes place for a flammable mixture to form; at temperatures above these limits, the mixture becomes too rich to burn. The limits of these explosive ranges depend on the volatility of the fuel and the atmospheric pressure.

At sea level, approximate temperature limits within which explosive mixtures may occur in the vapor space of a storage tank under stabilized vapor conditions are given below:

Aviation gasoline	−45 to + 25 F
JP-3	−40 to + 20 F
JP-4	−15 to +100 F
Kerosene	+95 to +170 F

At high altitudes, such as encountered in flight where the atmospheric pressure is greatly reduced, these limits change, generally becoming narrower and shifting downward.

Storage Problems

These approximate limits hold only for stabilized conditions under which the fuel vapors have reached an equilibrium state. Under other conditions flammable mixtures may temporarily exist well outside these temperature limits. For example, a gasoline tank on a warm summer day would ordinarily contain in its vapor space a mixture too rich to burn. However, removal of part of the liquid contents would produce a flow of air into the tank, diluting the vapor and possibly creating a flammable mixture. This situation would remain until sufficient additional liquid vaporized to restore the rich, equilibrium condition.

Since the jet fuels have somewhat lower volatility than gasoline, if they are spilled and ignited, the resulting fire may not spread across the surface quite as rapidly as with gasoline. This is particularly true with the kerosene-type fuels. In a major airplane crash the impact is sufficient to atomize the spilled fuel. This fuel mist will ignite readily, propagating flame rapidly in spite of any theoretical advantage of the less volatile, kerosene-type fuels.

Fire Contest Winners

Phoenix, Arizona, and Ottawa, Ontario, won the Grand Awards in the United States and Canada respectively for the best 1957 municipal fire prevention programs submitted in the international Fire Prevention Contest.

The contest is sponsored by the National Fire Protection Association of Boston, non-profit, educational and engineering organization whose membership is drawn principally from U.S. and Canadian business and industry, fire departments, and governmental officials.

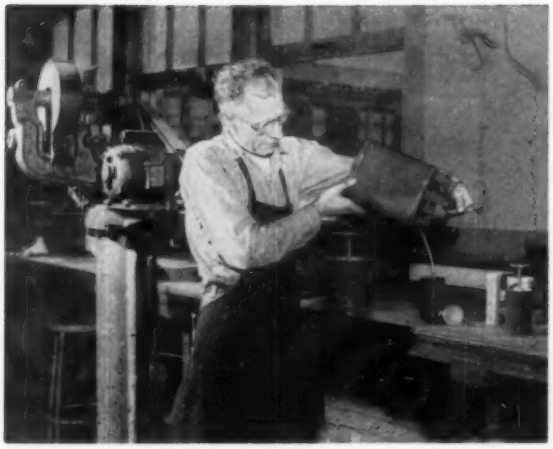
In addition to the municipal Grand Award winners, there were the following Grand Awards in the Contest's Industrial, Government, and Military divisions: The Tumpane Company, Terre Haute, Indiana (Industry); Atomic Energy of Canada, Ltd., Chalk River, Ontario (Government); McClellan Air Force Base, California (U.S. Air Force); the Presidio of San Francisco, California (U.S. Army); Naval Ammunition Depot, Hawthorne, Nevada (U.S. Navy); and RCAF Station, Greenwood, Nova Scotia (Department of National Defence, Canada).

All entrants in the contest's four divisions competed on the basis of year-around fire prevention activities. The purpose of the contest is to stimulate universal fire safety consciousness and to encourage broader use of modern techniques in both public and private fire prevention education.

Fire Control Seminar

The seventh annual Industrial Fire Control Seminar will be held at Purdue University on June 4–6. The three-day meeting sponsored by the Public Safety Institute of Purdue, is designed for industrial fire chiefs and plant fire specialists. A roster of fire experts will conduct meetings on a wide variety of industrial fire safety subjects. Further details about the seminar can be obtained from: Professor Shelby Gallien, Director, Public Safety Institute, Purdue University, Div. of Adult Education, Lafayette, Ind.

safe storage and handling of flammable liquids



Modern industry makes extensive use of flammable liquids. These flammable liquids may be the chief factor in the plant's production, or may be only one of several other materials entering into one or more manufacturing processes. For these reasons commercial and industrial plants require varying quantities of flammable liquids which to the fire inspector or plant fire protection or safety engineer pose many problems for their safe storage and dispensing, warns a recent bulletin issued by the National Board of Fire Underwriters.

An important factor affecting the size of the main storage is the location of the plant. If it is remote from railroads or water transportation and drums must be trucked a considerable distance, much larger main storage will be required than when the plant is close to rail, water or other means for receiving frequent shipments. It is important, however, that the main storage of flammable liquids be separated from the processes of other departments. The main storage should preferably be in a separate building provided for that purpose, but if under the same roof with other portions of the plant, it should be in a special storage room properly constructed and protected.

Consider Floor Loads

When determining allowable storage requirements due consideration should also be given to floor loads and arrangement of storage. The design of inside storage rooms should take into consideration the possibility of flammable liquids or vapors reaching lower floors or basements through unprotected openings where there may be sources of ignition.

The construction of the building in which the storage, handling or process is to be carried on has an important bearing on the ultimate allowable storage. Obviously if the building is of wood frame construction and more than one story in height, such inside storage cannot be viewed as favorably as in a building of fire-resistive construction. Conditions resulting from exposure or nature of occupancy may be such as to render unsafe any storage over and above what may be needed for immediate needs. In part at least, inside storage may be increased in proportion to the degree of improved construction.

Bound up in the consideration of construction is that of fire prevention and extinguishment. Under no conditions should materials be stored so that flammable vapors from open, leaking, or ruptured containers will come in contact with sources of ignition. Without means for the automatic extinguishment of such fires in their incipiency, extensive fires may be possible and probable, even though the storage is in fire-resistive buildings. For this reason a system of automatic sprinklers or other automatic extinguishing system should be seriously considered for con-

tainer storage of any appreciable quantity. Also suitable fire control devices, such as small hose or portable fire extinguishers, should be available at locations where flammable liquids are stored.

From the foregoing it is plain that each case involving the inside storage of flammable liquids must necessarily be considered on its merits. There are, however, certain fundamental factors that must be taken into consideration and carefully weighed in order to determine the extent to which any such inside storage may be safely permitted.

Flammable liquids are relatively safe so long as they are confined in a closed container. Their inherent hazard comes into play when in open containers or when leaks or spills occur; then the degree of danger is largely determined by the flashpoint of the liquid, its ignition temperature and the flammable limits of its vapor.

The rupture of containers may be brought about by any of the following causes: Physical damage due to rough handling or falling, possibly the result of insecure tiering or other careless and improper storage methods; deterioration of the container from corrosion and subsequent failure; and excessive interior pressure brought about by exposure to high temperatures.

The containers themselves require careful consideration. They should be constructed in accordance with the regulations of the Interstate Commerce Commission; these regulations assure rugged and safe construction. If they are not used in interstate commerce they are not required to conform to Federal regulations and where State or local rules are lacking they may consequently be of light, flimsy construction and therefore readily vulnerable when subject to rupture stresses due to impact or high temperatures.

The size of the container is also significant to the general storage problem. With equivalent container construction storing the same material and exposed to the same hazards, it is reasonable to conclude that the smaller the container, the safer the storage.

Quantity limitations for closed container storage for various occupancies are covered in the NBFU Standards on Flammable Liquids, No. 30. These standards include allowable limits for dwellings, apartment houses, assembly and office occupancies, mercantile occupancies, general purpose and public warehouses, flammable liquid warehouses and storage building; also requirements for bulk plants, commercial and industrial establishments, and processing plants.

The dispensing of flammable liquids warrants careful consideration. The inherent hazard of a flammable liquid becomes active when the flammable liquids are open to the atmosphere. Therefore dispensing methods such as from faucets into open containers should be discouraged. The safest method is through the use of a pump and employing securely attached and continuous piping or hose lines. When flammable liquids are transferred from one container to another, the two containers should be electrically bonded together and the system effectively grounded.

Pictures by courtesy of Protectoseal Co.

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THE FIRE UNIT —WITH THE 9-WAY PUNCH

Mobile unit features dry chemical but also provides eight other extinguishing agents.

A compact new portable fire-fighting unit represents a versatile means of quantity application of dry chemicals to control major fires. The manufacturer states that it has seen repeated use on both demonstration and accidental fires, competing with equipment many times its size and cost.

The new unit was conceived to place maximum protection within the cost requirements of small operations. Its radically-simple design allows even an untrained operator to use it effectively, simply by opening the nitrogen source and hose nozzles.

New effectiveness is gained through use of an invertible sphere to store 1500 lbs. of nitrogen-propelled dry chemicals. While the unit is idle, outlets are at the top, above the powder level, eliminating any possibility of clogging. In use, the sphere is automatically inverted to working position.

Because there are no dead spots in the spherical shape, nitrogen and powder circulate more completely before entering the hose. This provides a stronger, steadier flow.

After use, the unit can be completely cleaned and ready for the next usage in a matter of seconds: The sphere is simply returned to the original position, and the remaining nitrogen blows lines clean.

Dry chemicals, propelled by a high-pressure nitrogen flow, form the primary fire-fighting agent. However, eight different assisting agents are also provided. These include any combination of either fog or straight stream with water, foam, wet-water, or wet-water foam.

A second spherical tank contains the water supply. Side tanks give an additional capacity of 30 gallons of 3% foam chemicals, 30 gallons of wet-water, and a total of 880 cu. ft. of nitrogen.

All chemicals and water are expelled by compressed nitrogen. Sufficient pressures are released to force the chemicals through severe heat thermals to the base of high-pressure fires. Because no outside pumps or motors are used, the unit is quiet enough to allow oral directions in a normal voice.

Hoses are always connected for instant use and mounted on continuous-flow reels, eliminating the need for complete unreeling. They are made of neoprene to resist acids, oil, and heat. From two to four operators are recommended, though one man can handle the unit successfully.

A typical demonstration fire was at a San Diego, California, aircraft plant. There, a 78 ft. fuselage was sprayed with 1700 gallons of 140-octane gasoline, then ignited. Without special clothing, operators "rescued" two dummies from the fuselage in 30 seconds and had extinguished the blaze within 1 minute and 55 seconds. Half the dry chemicals and one-sixth of the wetting agents had been used.

Designed originally for major oil-field fires, the unit is expected to find widespread use in industry, aviation, and municipal fire-protection, or wherever major fires are a hazard. The complete unit is available mounted on truck trailer, or skids, and can be customized according to specifications.

A source for further information about the fire fighting unit can be obtained on inquiry to the editor.

Picture by courtesy of Fire Boss, Inc.

Sight Saving Conference

Medical advances over the past fifty years and future goals in the battle against blindness were reported at the annual Sight-Saving Conference of the National Society for the Prevention of Blindness held recently at the Bellevue-Stratford Hotel in Philadelphia. The meeting marked the golden anniversary of the nonprofit organization with the theme, "Conquer Blindness: Mission at Mid-Century."

Heard Progress Report

Approximately 500 medical men, nurses, social workers, educators and prevention of blindness workers from all over the country who attended the conference, heard scientific progress reports on the nation-wide fight against blindness. Also discussed were visual problems of children, industrial eye safety, and the role of the volunteer in prevention of blindness. A special feature of the three-day meeting was a workshop demonstration of how local sight conservation agencies can employ public relations more effectively.

In a pre-conference statement, Dr. Franklin M. Foote, executive director of the N.S.P.B., warned that more than 86,000 people in Pennsylvania alone are victims of a blinding eye disease called glaucoma—and half of them don't know it. "Thousands of our senior citizens in Pennsylvania—and across the nation—will lose their sight unless glaucoma is detected and treated promptly," he declared.

"Because glaucoma often strikes without obvious symptoms, about half of its victims are unaware of their condition until it is too late," he said, adding that "sight lost to this insidious disease cannot be restored by medical science. However, once detected, the progress of this disease can be arrested and remaining vision saved in most cases."

Following are some of the highlights of interest to the industrial field.

A safety director, speaking at an industrial session, told the conference how his plant achieved "140 million man-hours without the loss of an eye."

Robert W. Verhaaren said that "soft sell" of voluntary eye protection and good union cooperation were the principal factors contributing to "fifteen years of eye safety success" at the Ford Instrument Co., New York. Faithful use of protective eyewear by workers, supervisors and plant visitors was combined with publicity—"one of our strongest weapons," according to Mr. Verhaaren—in establishing the safety record of the firm, a division of Sperry Rand Corp. The unique safety record of the plant was likened to an "industrial eternity" free of serious eye accidents by James E. O'Neil, chairman of the session and director of industrial service for the Society.

Another speaker at the same session charged that the armored knight of medieval times had a more "enlightened idea of self-preservation" than modern man, who "prides himself on the fact that he meets the hazards of life without any protection." Miss Louise Candland, a registered nurse and industrial consultant, said she was "often appalled at the risks both workers and management take with their eyes" in firms with no full-time nursing or medical service.

"Many of these small industries have eye hazards as great or greater than some larger industries," she said, adding that inadequate first-aid preparation helped compound eye injury problems in many of these plants. Miss Candland urged medical people, management and unions to take a more active part in promoting vision programs in plants employing 300 or less people.

Workable Plans Exist

Workable eye safety plans for both small and large industries do exist today, Miss Candland said. "The Wise Owl Club," she declared, "is one of the best incentive plans for promoting the use of eye protection that has come along in years."

Sponsored by the Prevention of Blindness Society, the Wise Owl Club is open to men and women whose sight has been saved by shatter-proof eyewear in on-the-job accidents.

Recent improvements in devices and methods to aid persons with low vision were reported by Dr. Bernard C. Gettes, director of the Wills Eye Hospital low vision department. He described new magnifying lenses which fit standard metal or plastic frames but provide a "larger and clearer field than ordinary spherical lenses of similar power," at a scientific session of the Conference.

Philadelphia's public school system was installed as the 2,000th chapter in a unique industrial safety plan, when the NSPB presented William E. Brunton, vocational director in Philadelphia's schools, with a charter in the Wise Owl Club of America at a luncheon closing the 1958 Sight-Saving Conference. Other speakers at the session were Mayor Richardson Dilworth and Norman V. Lourie, state deputy secretary for social welfare.

Thorough Protection

"Eye safety coverage in the industrial arts and vocational schools here will be the most complete in the nation," according to Robert F. Irwin, who made the presentation. A director of the Society and the Pennsylvania Working Home for the Blind, Mr. Irwin said that "no other system in the country matches this thorough eye protection for vocational high school students."

Mr. Brunton stated, in accepting the charter, that 1,000 students in machine shop, wood shop, auto body, chemistry and other industrial subjects would be covered when the program was fully launched on April 30. Expansion of eye safety to shops in senior high schools is also a future possibility, he indicated.

According to the National Society, hundreds of thousands of students face eye-hazards in vocational, industrial arts and chemistry classrooms comparable to those existing in industry today.

"Protective eyewear is more readily available to industrial workers, however," said James E. O'Neil, director of industrial service of the Society, "than it is to youngsters learning the same skills in school.

"The extensive eye safety planning now conducted in Philadelphia is setting an example for vocational schools throughout the nation," he declared.

The Atomic Energy Commission has presented an award to the Nuclear Fuel division of Olin Mathieson Chemical Corporation in recognition of its "excellent safety record" in 1957.

At ceremonies in New Haven, Conn., the Nuclear Fuel division also received an award from the Manufacturing Chemists' Association and an Olin Mathieson Presidential Safety Award. The division manufactures components for nuclear reactor cores.

The A.E.C. award was accepted for the division by Edward Hartshorne, division general manager, and presented by Jon D. Anderson, manager of the A.E.C. operations office in Schenectady, N. Y. Mr. Hartshorne also accepted the Manufacturing Chemists' Association Safety Award, presented by John E. Gagnon, Olin Mathieson director of personnel and labor relations, and the Olin Mathieson Presidential Safety Award, presented by N. H. Collisson, Olin Mathieson senior vice president for production and engineering.

Mr. Hartshorne said he was "extremely pleased to accept these awards on behalf of the staff of the Nuclear Fuel division. Safety is a management responsibility in the division. Our safety record results from the thorough, sound and intelligent guidance of the Atomic Energy Commission."

• • •

Dravo Corporation has awarded its highest safety honor—the President's Award—for 1957 to the superintendent of construction on a new sintering plant being built by Dravo for U. S. Steel Corporation at Saxonburg, Pa. Superintendent John M. Snyder accepted the award from President Carl B. Jansen. Since starting on the job in June, 1956, Saxonburg employees have never recorded a disabling injury; 650,209 injury-free man-hours were compiled in 1957.

Top safety performances among Dravo divisions and subsidiaries were recognized with bronze plaques, as follows:

Engineering Works Division—Superintendent W. L. Glassbrenner; 828,599 safe hours since October 28, 1953.

Keystone Division—G. H. Hartman, Supervisor of Number Four Landing, Neville Island; 206,192 safe hours; a 12-year record—1946 through 1957.

Dravo-Doyle Company—W. L. Speakman, operations manager; 172,434 safe hours since January 27, 1956.

Union Barge Line Corporation—Captain R. S. Fry; Towboat "William Penn"; 171,484 safe hours since August 30, 1955.

Contracting Division—Superintendent R. C. Hilte; installation of a water intake structure for Union Carbide and Chemicals Co., Institute, W. Va., for 152,316 safe hours since June 6, 1955.

Three special awards were given for "outstanding performance" in safety during 1957.

Superintendent Raegler was cited for four long no-accident periods amassed by Neville Island employees during the past three years. A new record was established during 1957 when 2,460,000 injury-free man-hours were compiled over a period of 346 days.

Superintendent Edward J. Turnbull of the Machinery Division accepted the award for the Gary sinter plant, which completed 516,-

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000 man-hours without an accident during 1957.

Superintendent Thomas D. Blum received the award for the Stores and Transportation Department at Neville Island which has completed 626,000 accident-free man-hours since July 30, 1951.

• • •

One of the top safe-driving records in Greyhound's history has been compiled by H. D. Short of Memphis, Tennessee, who recently was cited by the Greyhound Corporation for driving 31 years without an accident.

Short's achievement is remarkable, for under Greyhound's safety program even the most trivial mishap is considered to be an accident.

During his years of driving, he has covered a total of 2,000,000 miles.

• • •

Winner of the annual safety award of the National Safety Council for the fourth straight year, the Can Manufacturers Institute honored 83 member can plants for their individual safety records at the Institute's annual meeting recently.

While the accident frequency rate for 1957 from the 189 reporting plants rose slightly to 5.93 compared to 5.90 in 1956, William J. Milton, Institute President, explained that the rise was regarded as favorable since increases in other factors affecting the rate had been expected to result in a proportionately larger increase in the 1957 rate. Only 170 plants reported in 1956, he pointed out, 56,000 employees with 114 million man-hours reported last year compared with 52,000 employees reporting in 1956 with 112 million man-hours.

Individual company plaques and certificates will be presented to the 83 metal can plants for their part in contributing to the safety program of the industry.

• • •

The Fort Wayne plant of Falstaff Brewing Corporation has been named winner of the firm's first inter-plant safety contest. Plant Seven (Fort Wayne) won over the corporation's seven other plants and will receive a plaque. Individual lapel pins will be awarded to all employees in the production and maintenance departments.

Plants were judged on 18 basic safety activities, plus a miscellaneous category with points awarded according to performance in each activity. Principal factors were accident rate, severity rate and cost per barrel.

Plant Seven scored 779 out of a possible 1000 points. Falstaff's Plant Three, Omaha, finished second with 755 points. For the second straight year production workers had fewer disabling accidents at the Fort Wayne brewery. The frequency rate dropped 61 percent over the previous year, the production manager added.

• • •

St. Regis Paper Company announces that its company-wide award for the most outstanding safety achievement of the year has been won by its Kansas City, Missouri, multiwall bag plant. The plant completed operations in 1957 without a lost time injury.

Divisional safety awards for 1957 were also conferred on six other St. Regis plant locations. The Machine Shop at Emeryville, California, won the Machine Division annual safety award for the second consecutive year, with a perfect no losttime injury record.

The Printing Paper Division annual safety award went to the Bucksport mill with 1,666,079 man-hours completed and only seven lost time injuries. This is well below the over-all company rate for 1957.

The Tacoma, Washington, mill won the Kraft Pulp & Paper mill annual division safety award with only six lost time injuries while working 1,097,027 man-hours.

Awards were also given to the Southern Woodlands Division at Jacksonville, Florida, and the Panelyte Division at Kalamazoo, Michigan. The Muskingum Fiber Products Division at Coshocton, Ohio, winner of the newly-established Container Division annual safety award, completed 1957 without a lost time injury.

• • •

The SoundScriber Corporation in North Haven, Connecticut has been cited for an outstanding record of industrial safety by Employers Group Insurance Companies in Boston. The company has completed more than 670,000 man-hours of work without a lost-time accident. This compares favorably with a nine month average of 11.4 accidents per million man hours announced recently by the U. S. Bureau of Labor Statistics.

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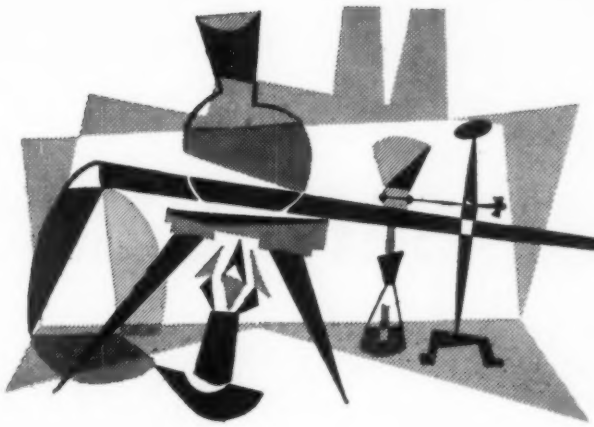


industrial hygiene

Auto Exhaust Control

The independent Air Pollution Foundation, now directing its entire scientific research program to solution of the auto exhaust problem, said recently the cost of control by currently proposed methods will probably be in the range of $50 to $85 per year per automobile.

Noting that this would result in an annual bill of $150 million to $250 million for the Los Angeles area with its 3 million autos, the Foundation emphasized:

"The simplest way to reduce this cost is by the highest caliber of research aimed at determining the degree and type of control necessary—and the development of a feasible device based on this information."

The cost estimates for control methods which have been most talked about were documented in a 21-page chapter, "Technical and Economic Aspects of Auto Exhaust Control Methods," in the Foundation's fourth annual Technical Progress Report.

Separate estimates were made for induction devices, direct-flame and catalytic afterburners, nitrogen oxide eliminators, fuel changes, and combustions of devices with modified fuels.

All estimates included the three factors that will affect an auto owner's yearly bill—original cost of a device or method, amortized over the five years which is the average length of time a motorist keeps a car; plus operation and maintenance cost, plus probable inspection fees.

The nature of inspection required to make a control program effective will depend upon the nature of the control adopted, the Foundation pointed out, but in any case will probably cost only about $1.25, or $2.50 per year if required semi-annually, thus making cost of inspection "by far the cheapest part of the cost of control."

An induction device would probably cost the average car owner only $12 a year, the Foundation estimated. But since an induction device cuts hydrocarbon emissions only during deceleration, it would effectively reduce smog only if "deceleration hydrocarbons" are far greater smog formers than other hydrocarbons —and while this possibility is not being overlooked in current research, it is believed most unlikely.

Another device which could cost the average motorist less than $50 a year would be a direct-flame afterburner, the Foundation said, but so far no one has figured out how to build one to burn exhaust gases successfully in a housing small enough to fit under a passenger car. Estimated average cost, should some one solve this imposing engineering problem: $20 a year.

All other methods which have been proposed would entail the use of either a catalyst requiring periodic replacement or a more expensive fuel. Average yearly costs on these were estimated as follows:

Catalytic afterburner, $50; nitrogen oxide eliminators, $55 to $85; an induction device plus a higher cost nonolefinic gasoline, $50.

On the subject of changing gasoline composition, the Foundation noted that in the course of basic studies it is now conducting on exhaust and smog, it expects to be able to clarify the question of whether a fuel containing little or no olefins to begin with would actually produce an exhaust with a lower smog-forming tendency.

In a covering letter to trustees and contributors of the privately-supported research organization, Dr. W. L. Faith, managing director, explained:

"Keeping auto exhaust controlled, after we learn how to make it stop causing smog, is going to be expensive. We believe it is important to make estimates now, so that we can evaluate the automobile-smog problem in well understood terms—dollars.

"To insist, for example, on complete control of auto exhaust irrespective of which constituent contributes to smog would be the expensive way to solve the problem.

"The cost can be drastically reduced if we control only those exhaust constituents proved to be responsible for smog. This is why research is necessary—to strike at the heart of the problem so that an economic solution may be found."

The first three chapters of the new Foundation publication deal with irradiation of auto exhaust, auto exhaust aerosols, and photochemical reactions. Copies are available at $3 each at the Foundation office, 2556 Mission Street, San Marino.

SAFEGUARDS AN POWER

The Shippingport Atomic Power Station, with the Pressurized Water Reactor (PWR) as its heat source, is the nation's first large-scale nuclear power plant to generate electricity for civilian purposes. With a net electrical capacity of 60,000 kilowatts, this plant at Shippingport, Pennsylvania, is the largest to be put in operation to date under the Atomic Energy Commission's Civilian Power Reactor Program.

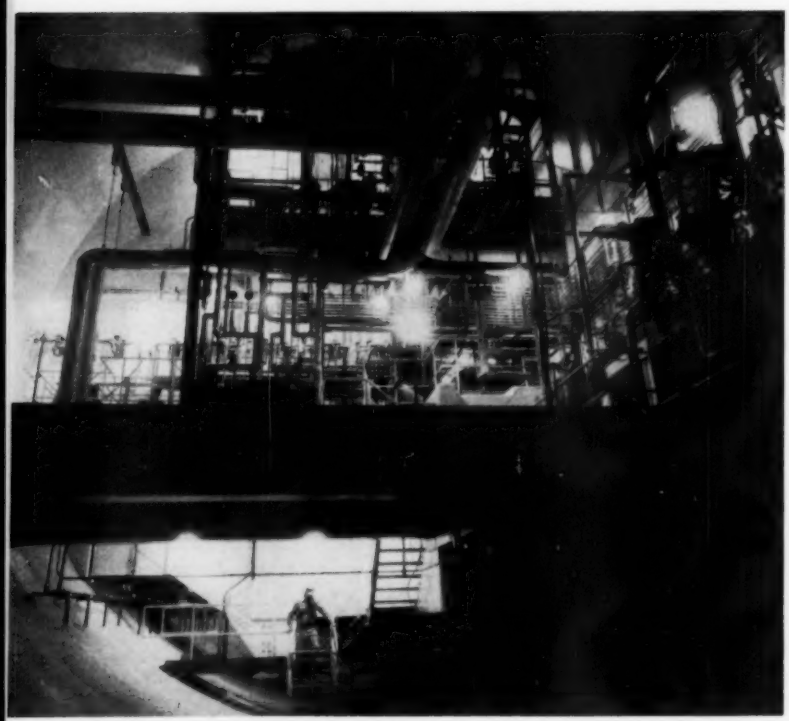
The primary purpose of the Shippingport plant is to advance the technology of pressurized water reactors rather than to generate electricity at costs competitive with ordinary fuels, and it will not be operated to furnish continuous power with a maximum load factor. Development and operation of the plant will, however, provide information from which reliable cost estimates can ultimately be made for plants of this type.

The pressurized water reactor project was carried out under the supervision of Rear Admiral Hyman G. Rickover, Chief of the Naval Reactors Branch, Division of Reactor Development, U.S. Atomic Energy Commission.

Construction on the pressurized water reactor began at Shippingport in the Spring of 1955. The Westinghouse Electric Corporation designed, developed, and built the reactor portion of the plant under contract with the Commission. The Duquesne Light Company, of Pittsburgh, Pa., built the electrical generating facilities and will own them under an agreement with the Atomic Energy Commission.

The principal plant features specified to Westinghouse in designing the pressurized water reactor were:

(Continued on page 46)



Mammoth, underground auxiliary chamber is cylindrical in shape and contains a large portion of the some 100,000 feet of piping extending throughout the plant. The steel chamber is encased in five feet of concrete as shielding.

TIMETABLE

September 6, 1954—Official ground breaking

March, 1955—Construction begun at the site

October, 1956—The 160-ton pressure vessel lowered into place

October, 1957—The core was placed in the pressure vessel

December 2, 1957—The reactor first went critical

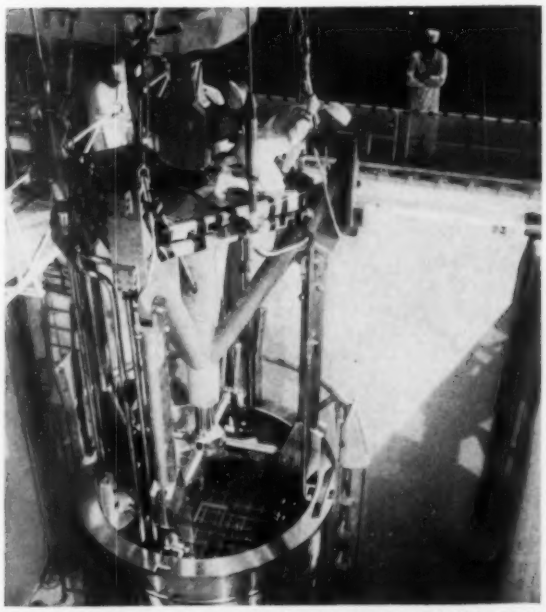
December 18, 1957—The main generator was synchronized and the plant began furnishing electricity to the utility system

December 23, 1957—The pressurized water reactor achieved its full power design capacity of 60,000 kw net

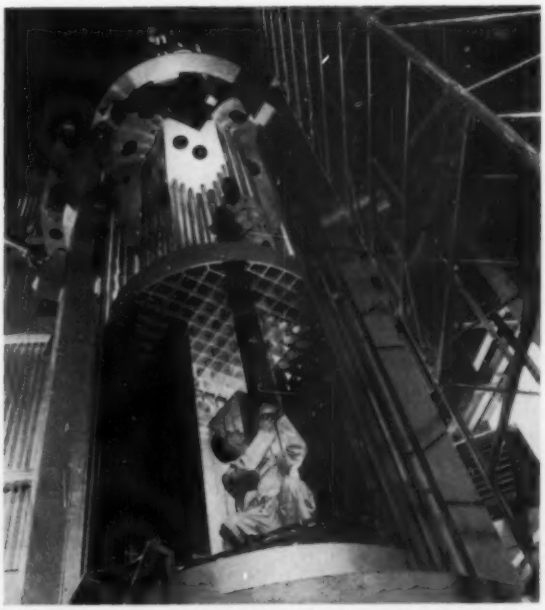
IN ATOMIC PLANT

This article is based on information furnished by scientists and engineers of the United States Atomic Energy Commission, Westinghouse Electric Corporation, and Duquesne Light Company.

Heart of atomic power plant is nuclear core being lowered into position.



The fuel charge of 14 tons of natural uranium and 165 pounds of highly enriched uranium is held within this nuclear core. Fission process creates heat which is converted to electricity.



What's inside the nuclear core? Wooden model of fuel element is moved into position. In actual reactor, 113 elements of natural uranium surround 32 elements of enriched uranium.

(1) The plant was to have a net electrical output of 60,000 kw at 600 pounds steam pressure.

(2) The reactor was to be cooled by ordinary water at 2,000 pounds pressure.

(3) The first core was to last for 3,000 hours at full power operation.

(4) Refueling was to be accomplished with minimum shutdown period.

(5) The reactor control system was to be as simple as possible.

(6) Commercial equipment was to be used wherever practicable.

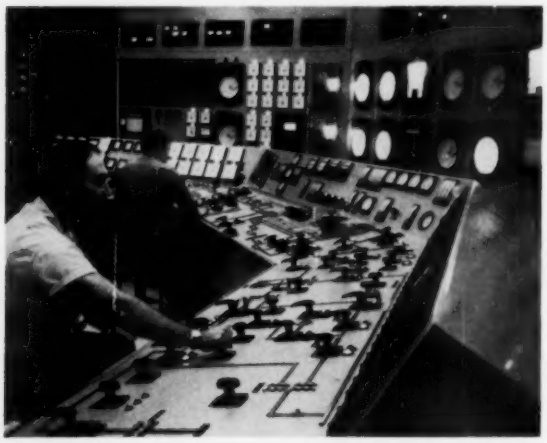
(7) The cost of operating the plant was to be the minimum consistent with these requirements.

Safety Measures

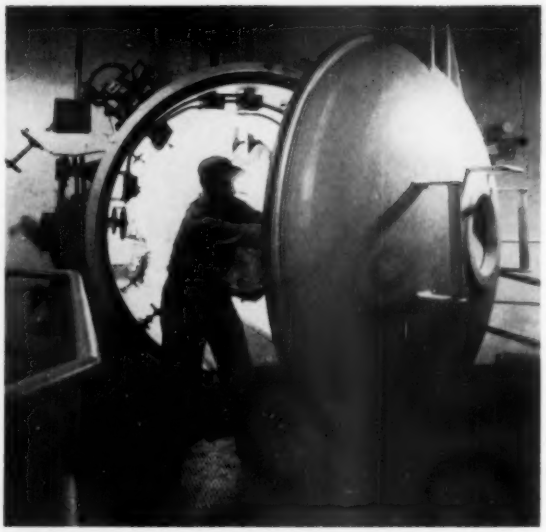
Preventing radiation hazards off-site has been a prime consideration from the inception of the project; it will continue to receive scrupulous attention in any training, operation, or testing at the station, over and above normal precautions taken to safeguard station personnel and equipment.

Basically, the approach has been to design and build highly reliable barriers for containing radioactive material and then to evaluate all possible accidents that might release radioactive material through any of these barriers. The results of these evaluations were incorporated in the plant design as it progressed.

Should an explosion occur in the pressurized water reactor, there would be no physical, chemical or nuclear hazard outside the site. No plausible sequence of events could release hazardous quantities of fission products beyond the site boundary.



Nerve center of the plant is this elaborate control room. All "instructions" to the nuclear reactor, its associated equipment and the turbine-generator are issued by the three operators at this console panel: foreground has controls for power distribution; center section is for turbine-generator; and the background operator controls the nuclear reactor.



This giant two-ton door seals off the auxiliary chamber which contains piping that transfers energy from nuclear chain reaction to the turbine-generator that will produce electricity.

In the pressurized water reactor plant design there are two barriers, independent and continuously monitored, between the fission products and the surrounding area. Fission products are contained within the fuel elements themselves, which are clad in corrosion-resistant zirconium-alloy boundaries designed, fabricated, and inspected for high integrity. The fuel elements are cooled by water (called primary collant) circulating past them in an all-welded pressurized system which constitutes the second containment barrier. Every precaution has been taken: rigid material and fabrication specifications, inspection procedures, stress analyses, testing, and controlled operating temperatures, to assure that this second boundary is made of high-quality material, correctly designed, properly manufactured, installed, and operated for maximum reliability. Should fission products leak into the water through flaws in the fuel element cladding, they will be contained in the primary coolant system, which is continuously monitored. Provisions have been made to locate and remove faulty fuel elements if the coolant radioactivity should become too high.

Third Independent Barrier

In addition, there is yet a third independent barrier: the entire reactor plant of the pressurized water reactor is housed in a group of interconnected vapor-tight steel pressure vessels, called the "reactor plant container."

All conceivable accidents that might theoretically threaten the safety of the pressurized water reactor plant have been analyzed: for example, loss of station power, loss of coolant flow to the core, reactivity accidents—e.g. uncontrolled rod withdrawal or cold water entering the core and causing increased reactivity, loss of reactor coolant if a rupture occurred in the primary coolant system, and accidental release from the radioactive waste disposal system.

Instrumentation

Instrumentation for the pressurized water reactor plant provides:

(1) information to the operator and his assistants to enable them to make decisions necessary to operate the reactor and its associated plant systems;

(2) accurate, reliable signals to the control systems of the reactor plant so that plant pressure and temperature can be regulated automatically; so the protection system can safeguard the plant against damage without unnecessary interruptions to power output, and so the alarms will sound should plant radiation and/or power parameters exceed normal values;

(3) information about the behavior of the plant and its components to further progress in reactor design whether or not such data are required for operation;

(4) monitoring of the plant and the surrounding area for radiation hazards—and information for automatic action to eliminate the possibility of radioactive contamination of the area;

(5) visual inspection by remote television viewing equipment, of the container interior and the boiler gauge glasses during operation.

Scope of Instrumentation

Reactor plant instrumentation involves four aspects of the pressurized water reactor plant. Reactor instrumentation includes the nuclear portions of the plant. Primary plant instrumentation covers the nonnuclear systems. Radioactivity monitoring is the third aspect; remote viewing of general and specific parts of the plant is the fourth. Each plant system contains instrumentation for either local or remote, or local and remote read-out. The alarm network depends on the instrumentation network.

Nuclear plants differ from conventional power stations chiefly in having reactors as the heat source and in the problem of radiation hazards. These plants require the following instrumentation not needed in conventional plants:

Reactor Instrumentation

The reactor has two instrumentation systems: (1) nuclear instrumentation reports the nuclear reaction —largely for control purposes; and (2) the core instrumentation system is for information only.

(1) This is the most important of the reactor instrumentation systems, monitoring as it does the neutron flux level of the core. The average neutron flux level of the entire core in neutrons per square centimeter per second is a direct measure of the heat output of the core. This instrumentation converts the neutron flux values, measured at the location of the neutron detectors, to power level and rate of power level change, enabling the operator to start up and operate the reactor safely. This information is also transmitted to the automatic reactor control system and to the reactor protection system.

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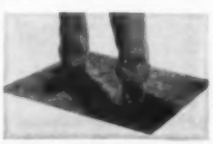

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City and State_____

(For details, use Key # Q-15 on card on page 1)

It should not be overlooked that the measurement of neutron flux values is a representative sample, not an absolute measure. Moreover, the neutron detectors must be located outside the pressure vessel because of the neutron flux level range (a ratio of approximately 10^9 to 1) and because of the formidable prob lem of penetrating the pressure vessel. For accurately monitoring the neutron flux level over its entire range, two tyes of detectors are used:

a) a boron trifluoride (BF_3) proportional counter that reports from below source level to about 10,000 times source level;

b) a compensated ionization chamber to include the range from 1000 times source level to 10,000,000,000 times source level.

The ranges of the two types of detectors overlap to insure continuity. Located in detector wells, they are positioned in the neutron shield tank. These units measure the leakage flux from the reactor—a function of the average core flux. The fraction of neutrons leaking through the neutron reflector, the thermal shields, and the pressure vessel is approximately 1/10,000 of the average neutron flux density in the core.

In addition, the instrumentation system computes the rate of change of the neutron flux level. As rates of power increase faster than a predetermined amount, the control rods are automatically inserted.

There are three independent channels all provided with one of each type of detector. When any two of these three channels indicate excessive neutron flux levels, the safety circuits shut the reactor down automatically or insert the control rods.

(2) This system provides facilities for measuring the following core performance characteristics:

a) power distribution in the seed and blanket;

b) internal and external temperature distribution in the seed fuel element; and,

c) detection and location of fuel element failure.

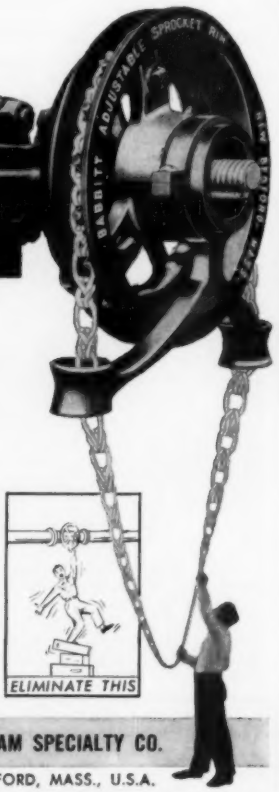
Temperature rise and fuel element temperature data from chromelalumel thermocouples, and rate of flow and differential pressure data from flow nozzles machined into the bottom adapters of the fuel assemblies, are used to compute power distribution. Thus unbalanced flux conditions are detected and control rod corrections made. Temperature and flow measurement data are used to establish the power gradients. This information is shown on the core instrumentation panel in the auxiliary control room. Detection and location of failed fuel elements is part of the core instrumentation system. The coolant from each of the blanket assemblies is periodically monitored for fission products.

Primary Plant Instrumentation System

This system includes all "conventional" instrumentation associated with the main and auxiliary fluid systems of the primary, or reactor, plant. Measurement of primary plant parameters (flow, level, pressure, temperature, oxygen concentration, acidity, etc.) is necessary for safe and reliable operation, and for

11-8

Safe Operation
of
Overhead Valves
with a
Babbitt
Adjustable
SPROCKET RIM
with Chain Guide



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Liquid Soap
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TABLE 1: OPERATIONAL MONITORING

The operational radiation monitoring system provides the information necessary for operating the primary plant within the radiation levels set by the Atomic Energy Commission. It has twelve channels: each with one or more detectors, a preamplifier where necessary, and a computer indicator to provide read-out information. The computer-indicator units are in the radiation monitoring panel of the main control room. The detectors, located throughout the reactor plant, are of six basic types.

a) Four leak detectors to monitor samples of secondary water drawn from each of the four steam generators. Abnormal activity in a sample indicates primary coolant leakage into the secondary system.

b) Four detectors to monitor the four compartments of the boiler chambers. Contamination build-up in the primary loop is accompanied by a general increase in the direct gamma radiation field. The intensity of this field in comparison with the "clean loop" value shows when decontamination is needed and whether compartments are accessible after shutdown.

c) A detector to monitor the water used to cool pumps, to control rod-drive motors, for the purification system, for nonregenerative heat exchangers, for neutron shield tank, etc. This cooling water may become contaminated by leakage of primary coolant through any of several heat transfer walls.

d) Monitors to check the air which cools the plant container for airborne particulate matter at four points: 1) the interconnections between boiler chamber No. 1 and the auxiliary container; 2) the interconnections between boiler chamber No. 2 and the auxiliary container; 3) the interconnection between the reactor chamber and the auxiliary container; and 4) the exhaust from the auxiliary chamber into the air treatment room. Any water-to-air leakage from the system should be picked up by these monitors.

e) An air gross-monitor to check the plant container cooling air, which is exhausted into the air treatment room and thence to atmosphere through a 95-foot stack. The gross particulate and gaseous activity of the air in the stack are measured by this monitor which is located near the top of the stack.

f) Monitors to check six cubicles for limited access: two near each of the two purification loops, and two in the auxiliary chamber next to the shielding around the flashtank, blowoff tank, and the pressurizer.

proper maintenance of the primary plant. Most important of this instrumentation is concerned with quantities relating directly to the reactor coolant. The indicating instruments for these quantities are grouped on the main control console of the reactor plant.

Signals for control and alarm circuits are also supplied by primary plant instrumentation. Thermocouples sense bearing and operating temperatures of pumps and other plant components. Primary loop temperatures are sensed for basic control purposes by five resistance thermometers in each of the four coolant loops. Four of these are fast response thermometers for plant control and information. The fifth thermometer in each loop is a highly accurate unit that calibrates the fast response units.

Each coolant loop also contains instruments for measuring flow, using the pressure drop across a calibrated venturi, and for measuring pressure by differential and static pressure units. Any portion of the reactor coolant system that may be isolated by valves has a full-range pressure instrument for operation information and, in some cases, for control. Units on the reactor vessel provide automatic shutdown on low pressure.

Radioactivity Monitoring

Radiation is monitored by two separate systems, one for measuring power level, the other for safety.

Power Level Monitoring System: This system provides the information necessary for operating the reactor plant within the radiation levels required by the Atomic Energy Commission. It has several channels, each containing one or more detectors, preamplifiers where necessary, and a computer indicator providing read-out. The computer indicator units are located in the radiation monitoring panel in the main control room. The detectors are located throughout the reactor plant. Channels and their functions are as follows:

(1) Four channels with gamma sensitive Geiger tubes detect primary coolant to secondary water leaks in each steam generator.

(2) Gamma sensitive ion chambers determine activity in each of the four boiler chambers.

(3) A gamma sensitive Geiger tube detects leakage of primary coolant into the component cooling water system.

(Continued on page 55)

KEEPING UP WITH

SKIN PROTECTION SERIES
other articles March & April

IMPROVED HANDCLEANER AND DISPENSER

Gojer, Inc., manufacturer of GoJo Handcleaner, has recently made engineering improvements on their GoJo dispenser which are said to double its mechanical service. The new features include a newly designed ratchet action which gives smoother lifetime operation, plus a streamlined top clamp which improves the appearance.

A major laboratory development is a new deodorant formulation which gives GoJo handcleaner a pleasing and refreshing scent. New production controls plus a double distillation process also give it an extrafine smoothness.

For details, use **Key # SP-1** on inquiry card on page 1.

POISON-IVY IMMUNIZER

Industries employing men as outdoor workers can help to avoid the lost work-time caused by ivy poisoning by issuing an immunizer which comes in a one-ounce bottle, enough to last a whole season. Mass industrial tests over the last four years show that preventive treatment started six weeks before the men might be exposed to poison ivy, oak or sumac, gives 75 to 90 percent protection from the painful affliction, the manufacturer claims. The immunizing treatment —"Oral-Ivy" made by Milderm Research Laboratories—has been mass tested by medical and safety directors on tree service workers known to be subject to ivy poisoning. It also has been tested clinically by physicians with private patients who suffer annually from the skin poisoning. Industrial reports show the treatment is effective in 75 to 90 percent of the cases—clinical reports show 70 percent or more of the private cases were benefited.

In industrial use, safety and medical directors recommend that men start taking the immunizer at least six weeks before they expect to be exposed to poison plants. They take five drops of "Oral-Ivy" daily in water, milk or fruit juice before breakfast during this pre-exposure immunity build-up period. Then, through the rest of the poison ivy season they take the same dose three times a week to maintain immunity. There are said to be no side effects.

For details, use **Key # SP-2** on inquiry card on page 1.

SKIN PROTECTION DEVELOPMENTS

SILICOTE LIQUID SPRAY

The use of silicones to protect the skin and prevent industrial dermatoses was developed in 1951 at one of the leading middle-west schools of medicine. This formula included 30% of the silicone oils in a petrolatum base. It was determined that Silicote would repel moisture and at the same time was non-toxic and non-sensitizing. Subsequently the spray has been used for the prevention and control of many types of industrial dermatoses resulting from contact with such agents as coolants, glue, acids, soluble cutting oils, chromates, resins, etc. It is not easily removed from the skin and should be applied in the morning and again after lunch.

The Silicote Liquid Spray was designed by the Arnar-Stone Laboratories, Inc. to provide effective protection combined with an ease of application through the aerosol method. It should be applied sparingly and rubbed in well with a "hand-washing" motion. The excess may be removed with a towel, but the protection remains.

For details, use **Key # SP-3** on inquiry card on page 1.

DERMATITIS PREVENTIVE

To offer a liquid skin protector and cleanser formulated in accordance with the most advanced medical thinking to counteract and prevent follicular dermatitis, The Chemical Corporation has introduced " Paraphlo" to its line. Medical and safety directors of several large companies have published studies showing excellent results from this compound, the manufacturer states.

Now industrial workers handling acids, dyes, greases, solvents, printers' inks and irritating drugs may all benefit from its balanced formula. Working samples and medical data are available without cost. Some territories are still available to responsible representatives in connection with the company's line of Practi-Kreme and PHLO products.

For details, use **Key # SP-4** on inquiry card on page 1.

IMPROVEMENTS IN METERING DISPENSERS

Metering Dispensers, designed especially for use with a lotion-type waterless cleanser, are now standard with nickel and chrome-plated swivel-type wall mounting brackets and chrome-plated reservoir bands. The swivel-type bracket facilities up-ending the dispenser reservoir for quick, easy refills. The patented, squeeze-type nozzle, provides a measured-quantity of the cleanser with each squeeze—the right amount for thorough cleansing, without waste. A scientific method of piercing the nozzle tips assures proper porting and long service-free life. Nozzle caps are made of polymethylene, a rigid form of polyethylene which effects a better fit and longer life in dispenser service. Manufactured by Hammons Products, Inc.

For details, use **Key # SP-5** on inquiry card on page 1.

SILICONE CREAM

This new addition to the Mine Safety Appliances Company's line of protective creams and lotions utilizes a new development whereby chemical inertness, adhesiveness and the ability of silicones to repel moisture is incorporated in a bland vanishing cream. The film provided by this silicone cream will help to protect the skin against such common irritants as soaps, detergents, industrial chemicals and allergens. The cream is relatively non-toxic and is buffered to the average pH of the acid mantle of the skin. The barrier formed by the application of this cream is invisible on the skin and will not interfere with the normal action of the skin glands states the manufacturer.

For details, use **Key # SP-6** on inquiry card on page 1.

HAND CLEANER

A new waterless type hand cleaner, manufactured by Rubber-Seal Products Company, is said to remove easily and quickly printer's and duplicating process inks, tar, grease, graphite and most industrial soil.

When applied beforehand it forms a protective coating and will not harm the skin. When applied to a stained fabric area before laundering, the spot or stain will "come out in the wash." It is also suitable for cleaning linoleum desk tops, solid plastic coverings of all types, leather, etc. Available in five ounce tubes, sixteen ounce jars, or in bulk.

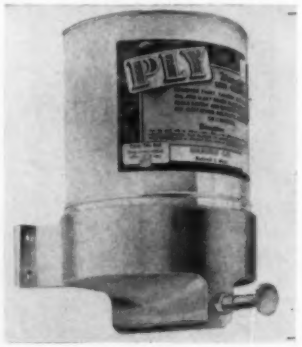
For details, use **Key # SP-7** on inquiry card on page 1.

PROTECTIVE SKIN CLEANSERS

Next to complete prevention of exposures to chemicals, one of the most important single measures that can be taken to reduce dermatitis is to remove irritating chemicals from the skin. This can be done by the prompt use of acid type hand cleansers such as "pHisoHex" and "pHisoderm" after each known contact with chemicals. These are said to cleanse more rapidly and thoroughly than soap and unlike soap contain no drying or irritating alkalis. pHisoHex has the same acidity as skin; it is said to be nonirritating and nonsensitizing. It is claimed to be much more effective than soap in ridding the skin of bacteria. During the process of washing with this cleanser an emollient protective antiseptic film is deposited on the skin. pHisoderm has the same cleansing and emollient protective effect as pHisoHex without, however, containing an antiseptic ingredient, hexachlorophene.

These cleansers develop suds in water of any degree of hardness, and of any temperature, hot or cold. They are active under alkaline and acid conditions. They are available in the form of a creamy fluid which can be used from special wall dispensers or refillable plastic, 5 oz. squeeze bottles. Manufactured by Winthrop Laboratories.

For details, use **Key # SP-8** on inquiry card on page 1.



WALL DISPENSER FOR SKIN CREAMS & CLEANSERS

A new wall dispenser for skin protective creams and waterless hand cleaner has been introduced by Milburn Co., makers of Ply protective creams and hand cleaner. The dispenser features a one-piece cast aluminum construction, with the plunger as the only moving part. The plunger measures a controlled quantity per stroke. Breakage and maintenance are minimized by the heavy-duty one piece construction. The plunger is removed easily for cleaning purposes. All lines of Ply creams and Ply waterless hand cleaner are now supplied in disposable 80-ounce units for use with the new dispenser.

For details, use **Key # SP-9** on inquiry card on page 1.

HAND CLEANING CREAM

To remove from the skin such tenacious and resistant materials as paint, lacquer, enamel, varnish, resin solutions, adhesives, inks and dyes, the Dennis Chemical Co. has developed a general purpose hand-cleaning compound. Use of the DEN-NEX cream, makes it unnecessary for employees to resort to hazardous solvents to remove difficult soils.

The product, which has the consistency of cold cream, is applied after work. It loosens and absorbs the adherent substances and can be easily rinsed off with water. In addition to the cleansing components, the cream contains skin-conditioning lanolin. It is supplied in case lots of 12 one-pound glass jars.

For details, use **Key # SP-10** on inquiry card on page 1.

SKIN CREAM PREVENTIVE FOR ALLERGIES

Reports of various testing laboratories, it is claimed, find this new skin cream, manufactured by the Silicote Corporation, effective protection for the prevention of dermatoses and skin allergies caused by irritants and sensitizing agents. "Siladerm" cream integrates 30% silicones in a petrolatum base. Rubbed on all non-weeping skin areas, the cream protects against soap and water, water miscible coolants and such primary irritants as concentrated nitric acid, etc. Both a preventative cream and a therapeutic ointment are available.

For details, use **Key # SP-11** on inquiry card on page 1.

APPLICATOR PACKET FOR POISON IVY OINTMENT

Outdoor workers are provided quick relief from poison plant irritation with individual poison ivy ointment packets introduced by Medical Supply Company. The company's No. A-17 poison ivy ointment is now being packed in individual foil envelopes for quick, on-the-spot treatment.

To apply the ointment directly to the affected area, the worker simply squeezes the foil envelope after first tearing off one corner. Quick, on-the-spot treatment before the toxic agent has a chance to spread, helps to localize the irritation. The ointment is effective as either a preventive or a cure. Six 3.1-gram individual foil envelopes of the A-17 poison ivy ointment are included in unit packages, properly sized for unit system first aid kits.

For details, use **Key # SP-12** on inquiry card on page 1.

NEW ANTISEPTIC HAND SOAP

Introduction of a new antiseptic hand soap has been announced by Turco Products, Inc., manufacturer of specialized industrial chemical processing compounds. Repeated daily usage of the new product, "Turco Handisan" with "Actamer," reduces resident skin bacteria by as much as 97%, it is claimed. The available evidence shows that the full reduction of the bacterial population of the skin achievable with bithionol soaps requires regular daily use for at least one week.

The resident bacterial population of the skin includes many deeply imbedded gram-positive organisms, not readily removable with soap and water, which are responsible for superficial skin infections and which may be contributory to

SURETY SURESEAL INDUSTRIAL GLOVES

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CARROLLTON, OHIO

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(For details, use Key # Q-18 on card on page 1)

All new TUC-CUP

***Lens slides easily into frame** and locks in position, but can be easily removed or replaced by the wearer.

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Integral contoured visor provides over-eyes protection. One-piece, shatterproof Wedgelock Lenses are specially designed with full cup green tint side shields. They provide complete side and under eyes protection.

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Quality Eye Protective Equipment — *Made by the Leaders in Plastics*

(For details, use Key # Q-19 on card on page 1)

secondary infections resulting from cuts and scrapes. Antiseptic soap, by inhibiting the growth of offending organisms, reduces the effects of their activity. By remaining in contact with the organisms and the skin long after application, this soap provides continuing protection from the multiplication of residual bacteria.

For details, use **Key # SP-13** on inquiry card on page 1.

NEW PACKAGING FOR SKIN CREAMS

The Boyer-Cambell Co. has announced recently that their skin cream, "Skin-Cote," now comes packaged in new plastic containers. Nos. 1, 2, and 3 are available in one-pint containers and 8 oz. tubes. No. 10 "Skin-Cote" is available in a newly designed polyethylene bottle. The use of plastic containers is said to result in considerable savings to users through reduced shipping weights and the elimination of breakage in shipment.

This cream or liquid when rubbed into the hands forms an invisible film which serves as a protective barrier between the skin and such hazards as cutting oils, fiber glass, gasoline, metal dust, and turpentine, etc. The creams contain lanolin to restore natural oils to the skin.

For details, use **Key # SP-14** on inquiry card on page 1.

PROTECTIVE COATING ENRICHED WITH LANOLIN

The Cadet Laboratories has announced a protective coating that is enriched with lanolin. "Sealskin" cream applied daily is said to provide positive insulation against most acids and alkalis. The coating is also stated to be impervious to water–soluble solutions. Cream is recommended for food processors, industrial workers, engravers and laundry and dairy workers.

For details, use **Key # SP-15** on inquiry card on page 1.

NEW PACKAGING FOR WATERLESS CLEANER

Viking Mfg. Co. has just announced that Viking Waterless Hand Cleaner is now available in colorful plastic containers. Spot surveys indicate that some users are enthusiastic about these wide mouth, shatterproof containers with lids that snap on and off easily. The new package reduces shipping costs significantly and provides the user with a handy, reusable container. Viking Hand Cleaner is a formulation of fifteen ingredients designed to protect as well as clean the hands. Its formulation includes hexachlorophene and cosmetic lanolin.

In addition to the new plastic pints, Viking Waterless Hand Cleaner still comes in its regular packaging–6 oz. and 16 oz. jars, gallon cans, and in bulk.

For details, use **Key # SP-16** on inquiry card on page 1.

NEW INGREDIENT IN SKIN CREAMS PREVENTS SPOTTING OF METAL PARTS

A corrosion-resistant ingredient which retards spotting of highly finished metal surfaces by workers' perspiration or fingerprints is now a part of skin protective lotions manufactured by Milburn Company. The anti-corrosion factor is dispersed in a water-soluble plastic film which is deposited on the skin by evaporation of Milburn's Ply No. 9 Liquid. As the worker perspires, his perspiration carries with it a portion of the corrosion-retardant from the water-soluble film. This counteracts the salts, acids and moisture of the persiration and prevents spotting or corroding of the metal surface.

Solvent Resistant

The new ingredient was developed to meet problems encountered in machining and inspection operations on delicate metal parts such as bearings; aircraft, instrument and electronic parts; parts for plating, etc. The plastic film which is deposited on the skin by evaporation of this barrier liquid is said to be impervious to kerosenes, petroleum-type cutting oils and solvents, and to most common hazards met in machining and inspection of metal parts.

For details, use **Key # SP-17** on inquiry card on page 1.

IMPROVED FORMULATION IN WATERLESS CLEANSERS

Hammons Products, Inc. announces an improved formulation in their lotion and gel type waterless skin cleansers. The new formulation embodies all of the qualities of Hammons and provides faster liquefication resulting in speedier cleansing action. Cleanser contains all U. S. P. grade chemicals including lanolin, glycerin, hexachlorophene (G-11) and oleic acid, blended in proportions thought to be best for cleansing and safest for the skin. Scientific "staging" and homogenization assure an emulsion that remains completely stable and retains its pure white color, pleasant odor and uniform consistency. It is free of harsh, harmful abrasives yet provides a penetrating cleansing action that removes imbedded greases and grime, tar, paint, asphalt and many other substances.

For details, use **Key # SP-18** on inquiry card on page 1.

Safeguards in Atomic Plant
(from page 49)

(4) Four beta-gamma sensitive Geiger tubes determine the gross activity (both gases and airborne particulates) in the air exhaust stack for the plant container.

(5) Four channels use a filter paper system and scintillation counters to monitor the activity of the air in the plant chambers.

(6) Six access cubicles are monitored for limited personnel access.

Safety Radiation Monitoring System: This system determines any increases in the normal background of the plant surroundings. All equipment necessary to locate and measure radiation hazards are included in this system. Areas normally occupied within the plant buildings will be monitored to warn operating personnel against increases in radiation levels. Hand and foot monitors will also be used, and monitors will be provided at exits. Film badges and dosimeters will be provided for all personnel to record cumulative doses of radiation.

A program of continuous monitoring of the environment outside the plant buildings has been designed. Integrating ionization chambers, mobile off-site stations, and river sampling stations are the components of this program, underway since early 1956.

The purpose of this monitoring has been to obtain data on the types and amounts of radioactive materials occuring in the site environs, and to measure variations in this normal background radiation. The program will be continued after station start-up to

TABLE 2: SAFETY MONITORING

The safety radiation monitoring system detects any dangerous increase in normal background of the plant environs. The system includes all on-site and off-site equipment necessary to locate and measure radiation hazards.

a) Since the reactor service building, the control room building, the radioactive waste disposal building, and the turbine building areas are all occupied, there are radiation monitors for these and associated areas to warn against abnormal radiation levels. They consist of: 1) twenty-four units to monitor the beta-gamma count rate; 2) a hand and foot monitor; and 3) exit monitors. There is an additional exit monitor in the gate house.

b) Monitoring outside the building will be accomplished by: 1) integrating ionization chambers; 2) mobile off-site stations; 3) river sampling stations.

1) Twenty integrating ionization chambers are distributed suitably inside and outside the plant security fence.

2) Five trailer-contained mobile stations are available for monitoring airborne particulate matter. Fall-out trays, rain samplers, and integrating prechargeable ion chambers provide intermittent reading and recording of statistical data.

3) Four sampling stations monitor water from the Ohio River.

c) Various types of portable monitoring equipment will be used as needed:

1) *Four beta-gamma survey meters.* Geiger Counters—Three ranges: 0.2, 2.0, 20 milliroentgens per hour (mr/hr)—800, 8000, 80,000 counts per minute (cpm). Probe on a four-foot, self-coiling cable. Tube and jacket slideout of cylinder for beta counting.

2) *Six beta-gamma survey meters.* High-Pressure Ionization Chamber—Three decade log scale 0.005 to 5 roentgens per hour (r/hr) gamma ray energy dependence substantially independent between 80 thousand electron volts (kev) to 1.2 million electron volts (mev). Beta window.

3) *Two beta-gamma survey meters.* High-Pressure Ionization Chamber—Three decade log scale 0.3 to 300 r/hr gamma ray energy dependence substantially independent between 80 kev. to 1.2 mev. Probe on rigid five-foot support.

4) *Two slow, fast neutron monitors.* Three ranges for slow neutrons: 0-300, 3000, or 30,000 neutrons per centimeter squared per second ($n/cm^2/sec$). The sensitivity of fast neutron counter is approximately proportional to energy from 0.1 to 20 mev and the three ranges correspond to 0-100, 1000, or 10,000 $n/cm^2/sec$.

5) *Four alpha-beta-gamma survey meters.* "Cutie Pie"—Ionization Chamber—Three ranges 0-25, 250 and 2500 mr/hr.

6) *Four cart-mounted air monitor units.* Geiger Counter—Beta-Gamma Sensitive. Three ranges 3000, 9000, and 27,000 cpm. With appropriate selection of air flow and sampling time, a sensitivity of 10^{-8} to 10^{-4} microcuries per cubic centimeter can be obtained.

indicate if any significant changes in normal background radiation are due to station operation.

Remote Viewing System: This system is composed of two parts. One part has five television cameras to view areas within the chambers during operation. One is located in each of four boiler compartments and one in the pressurizer compartment. Camera tilt, swing, and focus are remotely adjustable from the control room. One monitoring receiver is used; it can be switched to any one of the five cameras. The other part of the system has four fixed-position, fixed-focus cameras adjusted to view the four boiler drum level gauge glasses, and four television monitors, one for each camera in the control room.

TABLE 3: RADIOACTIVE WASTE MONITORING

The radioactive waste disposal system consists of 14 detectors in four separate channels. These monitors indicate activity levels in liquid and gaseous hold-up tanks, evaporator, and effluent channels to guide in determining discharge rates.

a) There are six liquid storage tank monitors mounted outside the concrete-enclosed underground tanks on long probes. These indicate decay of the radioactive resins and liquid wastes. When predetermined activity levels are reached, the liquids may be discharged or reprocessed as necessary.

b) There are five gas storage tank monitors which check radioactive gases stored under pressure in special vessels. When these gases (xenon 133 and krypton 85) have decayed to a safe level, they may be diluted and exhausted to the atmosphere.

c) The radiogas monitor continuously measures the activity of the gaseous mixtures being discharged through the stack. The gas is sampled by a vacuum pump after dilution. When safe concentrations of gaseous activity are exceeded, an alarm is set off.

d) The evaporator monitor checks the bottom of the evaporator unit which concentrates the radioactive waste liquids, and indicates when the desired concentration has been obtained.

e) The liquid effluent monitor continuously monitors the discharge line to the condenser effluent channel, and initiates an alarm if and when liquids are discharged at higher than an allowable rate of microcuries per second.

Radiation Safeguards

Heat in the reactor is the result of nuclear fission taking place in the uranium of the reactor core. At the same time various types of atomic radiation are given off from the radioactive fission products formed in the core. In the pressurized water reactor plant, these fission products are retained in the highly corrosion-resistant zirconium cladding of the fuel elements.

Safeguarding plant operating personnel and the surrounding area against any ill effects from this radiation has been a major design feature of the plant. Operating personnel are protected from direct radiation by heavy concrete (4½-foot-thick) walls surrounding all parts of the plant and by a 3-foot-thick water tank surrounding the reactor pressure vessel.

As water circulates through the reactor, small amounts of metallic corrosion products make it slightly radioactive. Over a period of time this contaminated water is routed to the disposal plant where the very small quantity of radioactive gases is stripped from it and stored until sufficiently decayed for safe release. The purified water is discharged to the river. The pressurized water reactor plant and waste disposal plant are so designed that even should some of the fission products contained in the core fuel elements escape into the water through small holes in the cladding, the plant can be safely operated and maintained and the water purified before it is discharged.

An extensive set of instruments continuously monitors direct radiation in the plant, as well as water in the plant and in the waste disposal system, and radiation in the air surrounding the plant. Information from these instruments is before the operator at all times and alarms sound if any radiation levels exceed normal values. Detailed operating procedures have been prepared and, on the sounding of one of these alarms, operators have been trained to take action to prevent the release of excessive amounts of radioactive material.

The equipment which reports radiation levels throughout the plant is divided into three systems: operational monitoring (see Table 1.); safety monitoring (see Table 2.); and radioactive waste disposal monitoring (see Table 3.) on pages 49, 55 and 56.

Radioactive Waste Disposal

Radioactive wastes discharged into the Ohio River or released to the atmosphere from the pressurized water reactor plant will be a very small fraction of the maximum permissible concentration recommended by the Atomic Energy Commission and the National Bureau of Standards (Handbook 61, "Regulation of Radiation Exposure by Legislative Means").

The design engineers for radioactive waste disposal, after consulting the Commission, the U.S. Public Health Service, the Pennsylvania Department of Health, and the Ohio River Valley Sanitary Authority, planned a system limiting concentrations to not more than 10 percent of the Bureau of Standards recommendations. In actual operation, discharged radio-

activity should generally be less than one percent of the limits set by the Bureau of Standards.

In addition, all released material meets the requirements given in Codes of the Commonwealth of Pennsylvania for disposal of radioactive wastes. The plant is a permittee of the Commonwealth under laws requiring new industries to obtain State approval for any system designed to discharge wastes into streams.

Protected Against Leakage

All tanks or burial facilities are protected against leakage into the ground by watertight concrete enclosures. Facilities are provided to remove water entering the concrete enclosures from leaks in the system tanks. A vapor containment system prevents release of vapor to the atmosphere.

Sufficient capacity to store radioactive gas produced by the plant is provided for maximum weather inversion conditions which might temporarily make disposal to the atmosphere dangerous. The worst weather inversion recorded in the area, the Donora smog in 1948, lasted five days.

Radioactive waste shipped from the site will be packaged to prevent radioactive hazard to persons involved in handling or shipping it.

Regulations of the U.S. Interstate Commerce Commission (Interstate Commerce Commission Regulations, 1956—Parts 71 to 78 for public carriers) will be observed.

Spent fuel elements will not be chemically reprocessed at the plant site. Thus, radioactive waste disposal problems will be relatively minor compared with those at installations where chemical processing is done.

Source of Radioactive Wastes

Most radioactive wastes will come from the reactor coolant system. They will consist mainly of:

(1) activated corrosion products and trace elements in the coolant, and

(2) fission products released from fuel elements if leaks develop in the cladding during plant operation.

The largest portion of the fuel will be uranium dioxide (UO_2), in zirconium alloy tubes with welded ends which have as high integrity as is possible under present manufacturing methods for this type of construction. The remainder of the fuel will be enriched uranium (U-235) in plate-type containers permitting even higher integrity. It is unlikely that any of the latter will rupture or release radioactive material to the reactor coolant.

Other possible minor sources of radioactive wastes will be the laundry, showers, laboratories, and decontamination rooms.

The radioactive waste disposal system was designed to operate satisfactorily with as many as 1000 failed UO_2 tubes. Since the plant provides facilities for detecting, locating, and removing leaky elements, it is highly improbable that the core will contain 1000 of them at any one time.

All liquid, solid, and gaseous wastes which might contain radioactive material are transported to a

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Model 555—Powerful 1½ horsepower vacuum cleaner for use with 1½", 2" and 3" hose. Motor detachable for use as blower or "Strap-Bak-Vac".

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(For details, use Key # Q-20 on card on page 1)

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(For details, use Key # Q-21 on card on page 1)

NEW RE-ROOFING METHOD

cuts costs as much as 55%

A simplified process which saves up to 55% of the installation costs for new roofs is now available from The Monroe Company. Known as the Monroe VULCA-DEK system, this method eliminates the expense of removing old roofs and does away with heating of roof coating, hot mop applications and use of gravel. Fire danger is completely eliminated.

Key to the VULCA-DEK process is the use of 3 Monroe roofing products. Among these are Hold-Tite, an extremely adhesive sealing cement which "vulcanizes" new felt to the old roof surface, heavy-duty 53-lb. roofing felt and Siliconed Rufferseal.

Monroe Siliconed Rufferseal is spread over the repaired surface as the final step in the installation of the new built-up VULCA-DEK roof. It is composed of long fibre Canadian asbestos, imported and domestic asphalts and special penetrating oils. Siliconed Rufferseal, and a companion Monroe product, Siliconed Asbestolite, are the only roof coatings now compounded with silicones. Monroe Asbestolite, which can be used in the VULCA-DEK system instead of Rufferseal, contains pure metallic aluminum flakes in homogenous suspension. When the coating is applied, these flakes produce a brilliant, attractive aluminum roof.

Monroe VULCA-DEK roofing specifications are adaptable to construction of both single-ply and 2-ply built-up roofs. Full details are given in Form No. 1090. **The Monroe Company, Inc., 10720 Quebec Avenue, Cleveland 6, Ohio.**

(For details, use Key # Q-22 on card on page 1)

waste processing area adjacent to the reactor plant, segregated, processed or stored, and disposed of ultimately.

Liquid and Gaseous Wastes: Reactor plant liquid effluent is piped to underground stainless steel tanks surrounded by watertight concrete enclosures where it is monitored for radioactivety. Depending upon the degree of its radioactivity, the waste liquid may be stored in these tanks while the activity decays, or may be processed through demineralizers and a gas stripper which removes radioactive products in the form of gas or, if within permissible limits, the liquid can be blended with the condenser cooling stream and discharged to the Ohio River.

Soluble radioactive impurities as well as particulate matter are removed in a series of mixed bed demineralizers. The processed liquid is sampled in test tanks to assure that the liquid discharged from the plant will meet allowable tolerances when diluted with the condenser cooling water stream. Dissolved fission gases are removed in a stream stripper under slight vacuum and are stored in steel tanks until they have decayed enough to permit safe discharge to atmosphere.

Liquid and gaseous effluents are monitored before discharge to the environment, and special monitoring is performed at enough sampling stations outside the plant area to assure safety. Material which would cause the plant effluents to exceed tolerance levels is reprocessed through the system.

Liquid wastes containing highly concentrated impurities, i.e., the fluids used for decontaminating equipment and facilities, are processed through a vapor compression evaporator. The distillate from the evaporator is sent to the liquid surge tanks and the concentrate mixed with cement and drummed for burial at sea.

Spent demineralized resin, principally from the internal purification system, is diverted by water to permanent underground stainless steel storage tanks in which the solids settle. These tanks are surrounded by a waterproof concrete enclosure. The water used to transport the resin is decanted to the liquid decay tanks for further processing.

The maximum rates of discharge for gases, solids and liquids, are expected to occur infrequently. However, the waste processing plant has the capacity to handle these maximum rates continuously.

Solid Wastes: Combustible contaminated solid wastes, such as paper, rags, and clothing, are incinerated. Gases from the combustion process are scrubbed and filtered to remove airborne particles. Ashes and wash water are then slurried to the resin storage tank.

Solid wastes, such as contaminated tools, metal turnings, and small equipment, are placed in 30-gallon drums and sealed. These are then placed in larger drums and shielded by pouring concrete between the two drums to reduce the radioactivity of the outside surface to allowable tolerances. Drums will then be shipped for ocean burial.

Larger pieces of equipment will be handled by remote control and suitably buried in a "graveyard" at the site.

(Continued on page 60)

Exhaust Purifier Puts Freeze on Fumes from Cold-Storage Truck

Exhaust purifier removes carbon monoxide contaminants from LP-gas truck.

An LPG-fueled fork lift truck equipped with a catalytic purifier has been the key to highly efficient, yet fully safe, cold-storage materials handling operations for Pillsbury Mills, Downingtown, Pa.

Pillsbury uses the liquefied-petroleum gas and exhaust purifier team to simplify and speed palletized handling both within a cold-storage area and between the cold room and a truck-loading platform—an area requiring routine negotiation of a steep ramp. The combination provides quick, flexible and economical

(Continued on the next page)

Fork truck, shown entering the cold-storage room, must also negotiate steep ramp. LP truck has fume eliminator.

handling while affording complete safety from fumes.

The company purchased the truck in January, 1954. It was put into operation initially both for the cold-storage-room operations and as an "extra hand" in helping to transport sugar, flour, soda and similar foodstuffs to the processing line. The Downingtown plant is one of five in Pillsbury's Refrigerated Foods Division, making refrigerated dough products.

Because of the fumes hazard in the confined cold box (60 by 90 foot floor area), electric trucks at first seemed the only means for improving on the manual handling system in use. But the steep ramp posed problems.

So the plant purchased the LP-gas truck whose more complete combustion usually means less carbon monoxide in exhaust gases than gasoline vehicles. But when, in subsequent operations, the truck operator was affected by accumulated fumes in the cold storage room, Pillsbury wanted to take no further chances. The company promptly installed a catalytic exhaust purifier on the truck.

The device—a replacement for the truck's standard muffler—contains a chemical catalyst that burns exhaust carbon monoxide and hydrocarbon fumes to an odorless, harmless effluent. The unit, sometimes called a catalytic muffler, is attached to the exhaust manifold of the truck engine.

The truck, equipped with the exhaust purifier—used in the cold box for more than three years now—has proved 100 percent safe. The truck operator mostly shuttles in and out, but has worked in the cold room for up to two hours at a stretch with no ill effects. In operation for two and often three shifts, the fork lift now loads an average of 10 to 11 over-the-highway trailer trucks a day, besides lugging the palletized packaged products into the cold room and stacking for storage before shipment.

One man with the truck now loads a trailer with palletized boxes in 45 minutes, where three men used to work for 2½ to 3 hours formerly loading by hand. A helper's time for restacking pallets where less-than-pallet lots are necessary brings the average reduction in man-hours to the 65-to-70-percent figure.

Extensive testing of the purifiers, both by the manufacturer and by independent agencies, has proved their effectiveness. One documented report by the manufacturer's Engineering Section, shows that the purifier eliminates an average of 99.7 percent of the carbon monoxide from LPG exhausts, 88.8 percent of the hydrocarbons and 83.9 percent of the aldehydes at governed speeds. Clean-up is almost 100 percent at idle.

In many states, combustion engines fitted with purifiers are now authorized and approved for underground work in the mining and construction fields.

In addition to fume free operations Pillsbury has found that the LPG truck equipped with the exhaust purifier offers many other advantages, such as simplified maintenance, operating economy and longer truck life. Other plants in the company's Refrigerated Foods Division are also using LPG trucks, equipped with the purifiers, for confined-area work.

Pictures by courtesy of Oxy-Catalyst, Inc.

Radiation Safeguards

(from page 58)

A site monitoring program, started early in 1956, will continue during operation of the plant. Goal of the preoperational phase was to determine amounts and types of radioactive materials occurring naturally in the environment of the plant site and to discover how this natural radioactivity varied over a period of approximately one and a half years before start-up of the nuclear portion of the plant. This will allow comparison with similar studies conducted after operation starts, to ensure that the plant is not contributing significantly to the natural environmental radioactivity. Evaluations are being made of the soil in the vicinity of the plant, of Ohio River water adjacent to and below the site, of well water within one-mile radius, and of vegetation and atmosphere in the general area.

First Aid Film

A new American Red Cross color motion picture, demonstrating the proper methods of first aid, has been sponsored as a public service by the Crown-Zellerbach Foundation, and is now available for public showings. The 16mm film was produced in two reels with a combined running time of about 29 minutes. The two parts, each with four sections, cover the basic lifesaving and related skills taught in the standard course presented in the Red Cross First Aid Textbook which was completely rewritten and published this past fall.

These basic skills are those involving: Bandages and Dressings; Artificial Respiration; Shock; Burns; Control of Bleeding; Poison; Injuries to Bones, Joints and Muscles, and Common Emergencies (heart attacks, epileptic seizures and fainting).

In each section the film sets the dramatic stage by depicting accidents and then demonstrates the proper methods of first aid called for by the particular emergency. While not intended to replace actual training in the standard first aid course, the film is designed for showing on TV, as well as before group meetings, and acquaints viewers with the same techniques taught in the standard course.

Black and white prints soon will be available on loan from Red Cross area offices and field representatives for group use. Prints also will be available at most Red Cross chapters offering first aid courses.

Produced in the Washington, D.C., metropolitan area by Washington Video Products, Inc., the film uses nonprofessional actors, including Red Cross staff members and volunteers.

Manufacturing Chemists' Meeting

The 86th Annual Meeting of the Manufacturing Chemists' Association will be held June 12–14 at The Greenbrier in White Sulphur Springs, W. Va. It is anticipated that more than 700 chemical industry executives will attend. Mr. S. B. Penick, Jr., president of S. B. Penick & Company, New York, is program chairman.

inside the trade

The Board of Directors of *ZENITH RADIO CORPORATION* has elected *Eugene M. Kinney* vice president in charge of the hearing aid division, it was announced recently by *Commander E. F. McDonald, Jr.*, Zenith president. Kinney was appointed hearing aid division general manager early in December.

He has been associated with Zenith since October 1, 1946. From 1946 to 1956 he executed assignments in every major phase of Zenith's home office operations. Kinney graduated from Dartmouth College in 1943 with a B.A. degree. He is a native of Buffalo, N. Y.

John F. Dowling

Henry J. Taylor, Chairman of the Board of the *SILICONE PAPER COMPANY OF AMERICA, INC.*, announces the election of *John F. Dowling* as Vice President in Charge of Sales. Mr. Dowling attended Amherst College and graduated from the Catholic University of Washington, D.C. Class of 1934. He has been National Sales Representative for the company.

To coordinate sales for an expanding line of resuscitation and respiratory protection equipment, *John F. Palmer* has been named Eastern Sales Manager of the *Medical and Hospital Department, GLOBE INDUSTRIES, INC.*, it was announced by *Max Isaacson*, president. Palmer, a veteran in the industrial safety fields, will direct Globe products to commercial distributors and government agencies.

Captain Howard Thomas Orville (retired), former chief aerologist for the U.S. Navy, becomes vice president at *BECKMAN & WHITLEY, INC.*, San Carlos, Calif. In this newly created post, Captain Orville will assist through the president, *John C. Beckman*, the Instrument and Missile Products Divisions as well as the board of directors in long-range scientific and technical planning. Product lines with which he will be presently concerned include meteorological instruments, high-speed research cameras, and explosive-actuated devices.

Darrell E. Albert, who joined *MINE SAFETY APPLIANCES COMPANY* in 1950 as a sales engineer, has been appointed product line manager for respirators and gas masks. For the past four years Mr. Albert has been sales engineer in Birmingham, Alabama. Prior to that he had been assigned to the Pittsburgh district in a similar capacity.

He was affiliated with Weirton Steel Company and Westinghouse Electric Supply Company in purchasing and sales posts before joining Mine Safety Appliances Company. Mr. Albert attended Carnegie Institute of Technology and Rose Polytechnic Institute. He is a member of the American Society of Safety Engineers.

Members of the *Fire Equipment Manufacturers' Association, Inc.*, recently elected a new slate of officers.

A. D. Symonds, executive vice-president of W. D. Allen Mfg. Co., Chicago, Ill., was elected president. He succeeds *Walter E. Morgan, Jr.*, assistant vice-president, Walter Kidde & Co., Inc., Belleville, N. J., who automatically becomes a member of the FEMA board of directors.

W. E. Tromanhauser, vice-president and general sales manager, Pyrene-C-O-Two Division, The Fyr-Fyter Co., Newark, N. J., was elected vice-president of the 16 member trade association. *Paul J. Nurkiewicz*, vice-president of Stop-Fire, Inc., Monmouth Junction, N. J., was re-elected treasurer of the group.

The newly elected officers will all serve one-year terms.

Elected to the FEMA board of directors during the meeting were *Howard R. Carlough*, owner, The Safety Fire Extinguisher Co., New York, and *L. C. McKesson*, vice-president, sales, Ansul Chemical Co., Marinette, Wis.

Robert E. Cervay has been named east central district manager for the *BUFFALO FIRE APPLIANCE CORP.* of Dayton, Ohio, according to *B. J. O'Hara*,

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gasoline • kerosene
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VENT-A-DRUM
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protects against dangerous explosions!

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(Use Key # Q-23 on Inquiry Card on page 1)

THE POSITIVE
LADDER SAFETY DEVICE

CLIMBING MADE SAFE!
If climber starts to fall, device locks in a notch automatically, instantly. Holds securely. Limits fall to 7 inches.

PREVENTS DEATH AND INJURIES
— FROM FALLING

AUTOMATIC, POSITIVE. Will instantly catch and hold workman if he starts to fall, **even if unconscious.** Requires no attention from climber; he climbs in normal manner. Inexpensive. Easy to install; 3 men can clamp it to ordinary ladder in few hours. Clamps to any rung ladder, peg ladder, pole or framework. No welding or cutting. Notched rail hot-dipped galvanized. Entire equipment rust and corrosion proof. Can be kept free of ice by applying heat inside the carrier rail. In use approx. 10 years. Approved by Safety Engineers and Govt. Agencies throughout country. Patented. Manufactured only by

SAFETY TOWER LADDER CO.
1024 Burbank Blvd., P.O. Box 1052
BURBANK, CALIFORNIA
(Use Key # Q-24 on Inquiry Card on page 1)

vice president and general sales manager. Mr. Cervay will be responsible for the fire-fighting equipment and systems sales of some 47 Buffalo industrial distribution outlets in Virginia, North and South Carolina, eastern West Virginia, and eastern Tennessee.

John B. Dunne

The appointment of *John B. Dunne* as Assistant Sales Manager was announced by *THE BOMGARDNER MANUFACTURING CO.*, of Cleveland, Ohio. Mr. Dunne comes to Bomgardner from *Globe Industries, Inc.*, of Dayton, Ohio, where he was Sales Manager of the Medical and Hospital Dept. Before going to Globe he was Professional Services Representative for Mine Safety Appliances Company in Pittsburgh.

Mr. Dunne will be responsible for working with the many sales outlets of The Bomgardner Company, who have manufactured a line of stretchers, ambulance cots, and allied equipment for over sixty years. He will also head up a program of diversification of products for industrial, medical and hospital use.

Well-known to the Industrial Health and Safety Fields, Mr. Dunne has been a frequent speaker throughout the country on subjects pertaining to respiratory protection. He has written several articles on subjects concerning industrial health. He attended Butler University, Columbia University and was graduated with a B.S. Degree from New York University. He was a Fellow at the Center for Safety Education at N.Y.U. He is married and has two daughters and a son.

Renamed the Hartman Booster, the former Oster Portable Lift is now being manufactured by *HARTMAN METAL FABRICATORS, INC.*, of Rochester, N. Y. Used primarily for materials handling and maintenance, the lift was formerly manufactured by *OSTER MANUFACTURING CO.*, of Cleveland, Ohio.

The opening of *FLEXIBLE TUBING CORPORATION's* new 16,300 square foot plant at 305 Crescent Way in Anaheim, California firmly establishes this New England company as a West Coast manufacturer. In its new Anaheim plant, Flexible will begin immediately a program of full scale manufacturing of a number of its flexible ductings.

The plant includes a fully staffed sales office, extensive warehousing facilities, and complete laboratory facilities for research and development. *Walter C. Burns*, who for many years has been Flexible's Western Manager at the company's location in Los Angeles, will be Manager of the company's expanded operations at Anaheim. *Robert H. Poulton*, Senior Sales Engineer, is in special charge of air and fuel duct designs for the aircraft industry. *Charles K. French* is Manager—Research and Product Development Department, and has charge of the new laboratory at Anaheim.

ALAN WOOD STEEL COMPANY has announced the appointment of *John T. Root* as Advertising Manager of the Company.

Perry L. Francis, Vice President, Marketing, stated that Mr. Root will be in complete charge of all advertising activities of the company relating to trade publications, and product advertising in newspapers of general circulation. *Charles D. Dorworth* will continue to supervise all institutional advertising of the Company.

Prior to joining Alan Wood, Mr. Root was Assistant Advertising Manager of International Salt Company of Scranton, Pennsylvania, for the past four years.

E. V. Coulter

E. V. Coulter, president of *MULTI-CLEAN PRODUCTS, INC.*, St. Paul, was elected to the board of directors of the Floor and Vacuum Machinery Manufacturers Association, Inc., at the Association's annual meeting, recently held in New York City.

Coulter was one of the co-founders of Multi-Clean Products, Inc., which has grown to be one of the nation's leading manufacturers of floor polishing and cleaning equipment, as well as a complete line of cleaners, sealers, and finishes for all types of floors.

SEARJEANT METAL PRODUCTS, INC., of Mendon, N. Y., has announced the outright purchase of the Sentry kickpress safety guard from *Thomas Industries, Inc.*, of Fort Atkinson, Wis., as an addition to its line of guards for presses and other machines. The product has been on the market since 1949 and is currently available through Searjeant distributors.

Safety Appointments

The State of Washington has a new Supervisor of Safety. He is 43-year-old *Paul W. Clymer*, a widely known veteran in the field of Safety. The new Safety Supervisor gathered much of his safety experience working in the mining and steel industries of Michigan and Indiana during the 1930's. In 1942 he joined the Health and Safety Service of the U. S. Bureau of Mines.

In 1945 Clymer joined the State's Division of Safety as state metal mine inspector and eastern Washington field supervisor of Safety. He left the State service in 1946 to become owner-manager of the Spokane Safety Appliance Company. He headed that firm until his recent appointment as Supervisor of Safety.

Clymer is an active member of the American Society of Safety Engineers. He served as secretary of the Spokane Chapter of the Society for ten years and in 1956 was chairman of that group. He was recently honored with a membership in The Veterans of Safety, a national society of safety engineers who have had fifteen or more years of experience in the field.

AMERICAN POTASH & CHEMICAL CORPORATION has appointed *Ernest Levens* to the newly created position of coordinator of safety and industrial hygiene, according to an announcement by Joseph C. Schumacher, vice president in charge of research.

Levens was head of the organic chemistry section at the company's main research laboratory at Whittier, Calif., since the laboratory was opened in March, 1953.

In the new position, Levens will be responsible for developing standards of safety and health for the manufacture, storage, shipping and use of new chemicals being developed by the company.

Safety Course

A short course in industrial safety will be given May 19 through 23 by New York University's Center for Safety Education, Dr. Walter Cutter, director of the Center, has announced. Presented in cooperation with the American Society of Safety Engineers, the course is especially designed for safety workers who have recently come into the field, management people with safety duties, and experienced safety specialists.

Classes are to meet from 9:15 a.m. to 5 p.m. Further information can be obtained from Dr. Cutter at the NYU Center for Safety Education, 6 Washington Sq. North, New York 3, New York.

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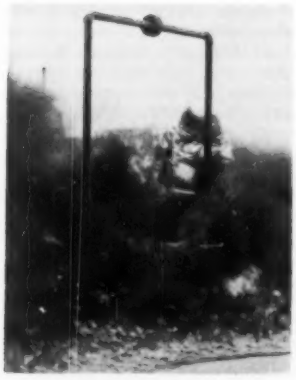
what's new for MAY



NEW FIRE-FIGHTING SUIT

(Use Key # 741 on Inquiry Card on page 1)

A NEW ALUMINIZED asbestos fire suit which is said to offer full protection to the wearer, even in direct flame, is announced by Safety Clothing and Equipment Company. This new suit, which consists of a helmet, jacket, trousers, shoes, mittens and carrying case totaling 23 pounds, is extremely pliable and easily donned in less than two minutes' time, the manufacturer states. Constructed with two basic inner linings of neoprene treated fiberglass cloth to serve as a vapor barrier, the suit also features a one-inch layer of fiberglass insulation bonded to aluminum foil, plus an outer layer of 3-M aluminized asbestos. The manufacturer states that this new fire suit, equipped with a self-contained breathing apparatus, has been fully tested in oil fields and by fire departments. It has been used at temperatures of over 2000° F for four-minute periods in JP-4 jet fuel, hydraulic fluid, lacquer thinners, dope and other flammable liquids.

Illustrated features on this 20th Century "armor" have appeared in the Sunday Pictorial Supplement of "Cleveland Plain Dealer" as well as King Feature Syndicate.

OBLONG-SHAPED FILLER CANS

(Use Key # 742 on Inquiry Card on page 1)

OBLONG-SHAPED gasoline filler cans are now supplied by Eagle Manufacturing Company for general use in the hardware, sports, automotive, and industrial fields. They are available in one- and two-gallon sizes. These gasoline fillers are made from tinned steel and are attractively lithographed. A vent is provided for fast pouring and all cans are equipped with

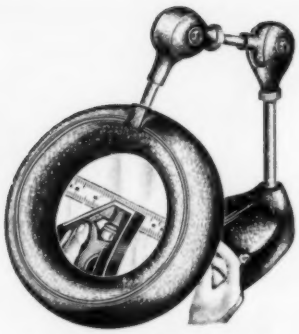
new "spark-proof Hy-Car rubber angled spout." Use of this 6" sparkproof spout has many advantages the manufacturer states. It is formed to the proper pouring position—eliminating any spilling of liquid from snap-back action, and is impervious to oil, grease, or gasoline. The spout is equipped with removable brass screen filter or strainer and a rubber plug to seal the opening when not in use.

SAFETY TOOL HOLDERS

(Use Key # 743 on Inquiry Card on page 1)

ROSE MANUFACTURING Company announces development and production of new tool holders and chisel grips. They are simple, dependable units that hold chisels, star drills, punches, marking dies and other similar tools safely, keeping fingers out of hammer or sledge area. They are adaptable to a wide range of sizes.

These safety tool holders are available in two models: the two-man model, 18" in length, holding tools up to 2¾" diameter, featuring a new flanged head for additional support and shock absorption, a longer lasting band, non-slip knurling on the handle, and T-handle adjusting screw: the one-man model with 6" handle, holds tools up to 1¼" diameter, weighing only 5 ounces, with shock-insulated rubber belting band that absorbs shock and prevents "creeping" of chisel through grip. The Safe-Hi Safety Tool Holders, formerly called Chisel Grips, are useful in a number of industries . . . construction, mining, railroading, public utility, petroleum processing, and others. Also available in spark resistant metals.



ILLUMINATED SIGHT MAGNIFIER

(Use Key # 744 on Inquiry Card on page 1)

EXPERIENCE gained during World War II has paid-off in the development of a new illuminated sight magnifier, manufactured by the Surty Mfg. Co. Sight magnifiers illuminated with either incandescent or fluorescent lights help to spotlight fine details in assembly and inspection work. Fluorescent lighting should be used when inspection is other than incidental. Incandescent lighting can be employed for the casual inspection of signatures, metal, cloth and leather.

The magnifier unit is made with a 4½" round lens which is individually ground and tested. Special spring tension joints hold the lens and light in position. The unit is so constructed that no heat radiates from the lamp. Models are available in many sizes for various industrial and clerical jobs, and in first-aid rooms to examine cuts, etc.

ANTI-RUST PAINT

(Use Key # 745 on Inquiry Card on page 1)

A NEW anti-rust paint, which can be applied with a minimum of surface preparation, is announced by National Asphalt Corporation. Offered under the trade name NACOR, the new coating is reputed to be suitable for use on most interior or exterior rusty surfaces without necessity of wire brushing, scraping or sandblasting. It can be applied by brush, spray or dip. No primer is required. One coat is sufficient for most applications. Due to inclusion of a newly-developed additive, NA-17R, combined with special chromate pigments, the paint is said to possess an unusual affinity toward metal. The manufacturer claims that it tends to penetrate existing rust layers and seal surfaces against further rust action. NACOR anti-rust paint is available in 7 colors—black, aluminum, red, oxide green, chrome green, gray, white—and clear. It is packaged in 5-gallon cans and 30- and 55-gallon drums.

SELF-CONTAINED COMBUSTIBLE GAS ALARM

(Use Key # 746 on Inquiry Card on page 1)

THE M-S-A EXPLOSILARM, a small completely self-contained combustible gas alarm, is announced by Mine Safety Appliances Company. The new alarm features low cost and low maintenance. It is intended for installation in non-hazardous areas. A sample line as long as 100 ft. may be used. The new alarm can be used in industrial plants wherever any combustible gas is used, by oil and gas industries in petroleum refineries and around scattered natural gas operations and gas compressor stations, in pump rooms for flammable products, on gas-fired industrial ovens to check the atmosphere before igniting burners, for checking leaks of hydrogen or natural gas in cable vaults, laboratories, etc., and wherever there is a combustible gas problem that does not justify a large installation.

The principle of operation is the same as in other larger M-S-A gas alarms and analyzers. The platinum filaments in the balanced-bridge circuit are designed for interchangeability without matching pairs, and have extreme zero and calibration stability. A locking door panel prevents tampering with controls. The M-S-A Explosilarm is contained in a cabinet 8¾ in. wide, 14¼ in. high, and 6¼ in deep.

NEW SAFETY EMBLEMS

(Use Key # 747 on Inquiry Card on page 1)

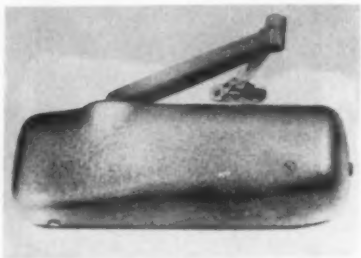
WILLIAMS Jewelry & Mfg. Company announces brand new Stock Safety Emblems—distinctive Award Buttons for the

Safe Driver or No Accident employee. These are available from stock with one year through 25 year engraving in any quantity. They can be supplied with synthetic Sapphires, Rubies, Emeralds or White Sapphires.

AUTOMATIC DOOR OPERATOR

(Use Key # 748 on Inquiry Card on page 1)

THE MANY benefits of automatic door operation are within the reach of everyone with the introduction of a new, greatly simplified door operator by Electronics Corporation of America. The entire mechanism is contained in a single, compact unit, not much larger than an ordinary door check. Installation, which can be made in a matter of hours, consists only of attaching the door operator to the door, then making a few simple electrical connections. The door operator is, therefore, as readily applied to existing doors as to new construction. ECA door operators are supplied with either mat switches or photoelectric controls. The instant a person steps on the specially designed mat leading through



the door, or interrupts the photoelectric beam of light, the door opens, stays open until passage is cleared, then closes automatically.

CLEANING HANDLING EQUIPMENT

(Use Key # 749 on Inquiry Card on page 1)

EQUIPMENT USED in material handling and packaging, such as automatic lifts, lift trucks, roller-chain and wheel conveyors, chain drives and track chains can now be cleaned simply and rapidly, without the need of disassembling the units or delaying the production line. This equipment can be cleaned speedily using one of the several solvents developed by Fine Organics, Inc. Spraying the equipment "in place" with the solvent selected and drying in minutes, if necessary with an air pressure gun, completes the operation. Equipment comes out clean and ready for work, its life is extended and "down time," labor and repair costs reduced immeasurably. Danger of fire is reduced. There are no toxic fumes, no undesirable residue and no special equipment is required.

SIDE SHIELDS ADDED TO PLASTIC-METAL FRAME SAFETY GLASSES

(Use Key # 750 on Inquiry Card on page 1)

THE CHICAGO EYE Shield Company has announced introduction of a new version of its plastic and metal frame glasses offered for the first time a year ago. So favorable has been the acceptance of the plastic and metal frame style, according to the manufacturer, that a new model with side shields had to be created to widen the range of application for the glasses. The new wire mesh side shield addition gives full closure around eyes yet maintains satisfactory ventilation to prevent lens clouding. The new glasses are available in 46 x 39mm and 48 x 41mm eye sizes in a choice of 20, 22, 24, and 26mm bridge sizes. Popular F-7 shape lenses are made in Clear or Antiglare Super-Safety glass, or in Clear Cescolite Plastic. Lenses offered in 6.00 curve only. All-in-one plastic section performs double duty as lens rim and bridge pad. Gives complete closure at nose section—is unaffected by skin oils and cleaning agents.

2½-LB. DRY CHEMICAL EXTINGUISHER

(Use Key # 751 on Inquiry Card on page 1)

DRY CHEMICAL POWDER is now available in a 2½-pound pressurized extinguisher from The Fyr-Fyter Company. Known as the Model 23-1, this portable extinguisher is recommended for emergency vehicles, trucks, and busses, small boats, and various light industry applications where on-the-spot protection is desired against incipient fires in gas, oil, paint, propane, chemicals, and electrical equipment.

Depression of the squeeze lever spreads a 60° wide angle blanket of non-freeze, non-toxic, non-conducting dry chemical powder to a range of 12 feet. The 2½-pound model is Underwriters' rated at 2-B, C. The chrome-plated case is both corrosion resistant and conspicuous for quick location in emergencies. Operating at a pressure of 150 psi and with pressure constantly indicated on a built-in gauge, the unit has been tested to 450 psi without damage. Accompanying bracket can be mounted near probable hazards, and the compact unit may be easily stored. New rubber valve assembly is said to be leakproof and foolproof, and manufacturer claims recharging is quick and relatively simple.

DECORATOR FINISH SINKS

(Use Key # 752 on Inquiry Card on page 1)

A NEW LAVATORY, available in 4 decorator colors is announced by Mansfield Sanitary, Inc. Made of easy-to-clean vitreous china, the lavatory combines a modern hexagonal design with an attractive sloping panel front. It measures 20" x 18" overall and provides a large 15¾" x 11¼" bowl. Features of the "Paramount" are concealed front overflow, non-splash rim and built-in soap dish. Center-set drain fitting is factory installed and available with pop-up or chain-pull plug. One piece cast hanger permits setting of fixture flush to wall. According to the manufacturer, the "Paramount" is suitable for installation where appearance is a factor.

HEAVY-DUTY PISTON HAND PUMP

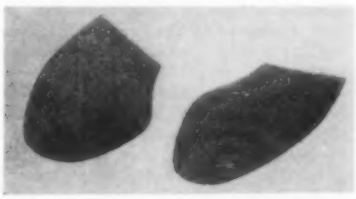
(Use Key # 753 on Inquiry Card on page 1)

A NEW piston hand pump, which has been employed exclusively to meet the exacting, heavy-duty requirements of military service, has now been released for general use by the Tokheim Corporation, manufacturer of petroleum equipment. Designated as the 1100 Series Double-Action Piston Hand Pump, the product has a capacity of 30 gallons per minute, pumping on both forward and back strokes. It is particularly suited to servicing heavy equipment in the highway and building construction fields.

Among the pump's many features are the double-action piston with heavy leather cups back-to-back to assure positive seal; spring-loaded, stainless steel, poppet-type valves and seats; heavy aluminum alloy housing; stainless steel interior parts; removable strainer screen; and a reversible handle which permits a wide variety of vertical or horizontal mountings. The self-priming pump, which is capable of a vertical lift up to 30 feet, is available in four models. Included are both hose and spout types, and automatic shut-off nozzle.

NEW ANTI-SLIP SOLE

(Use Key # 754 on Inquiry Card on page 1)

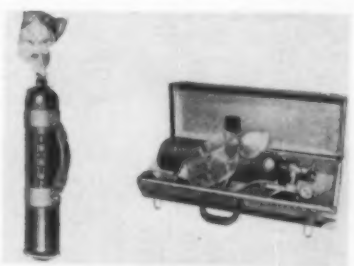


THE COATED ABRASIVES, INC., announces the availability of a new product called "Shur-Tred." "Shur-Tred," a patent-pending item, has been designed to eliminate the slipping or skidding which occurs on ice, oily or wet floors, etc. . . . , by attaching this product to the soles of rubbers, boots, or shoes. A special adhesive provides positive attachment of "Shur-Tred" to rubbers, boots, or shoes, and the water-repellent bond assures protection under all conditions. Suitable for plating shops, slaughter houses, garages, dairies, maintenance workers and wherever slippery conditions are encountered.

LIGHTWEIGHT OXYGEN INHALATOR

(Use Key # 755 on Inquiry Card on page 1)

THE DAVIS EMERGENCY EQUIPMENT Company is introducing a new lightweight inhalator (21 lbs. in case) with a 50 minute oxygen supply lasting 50 minutes or more on 100% oxygen setting. It



will supply a dilution of 50% air with the simple twist of a dilution valve. Both the two cu. ft. and sixteen cu. ft. capacity inhalators are now also offered complete without cases, but with mounting brackets, so that they are readily accessible in permanent locations in factories, planes, offices, service trucks, trains, police cars, fire departments, etc.

FIBER GLASS ROOF COATING

(Use Key # 756 on Inquiry Card on page 1)

A NEW fiber glass roof coating that is reputed to have absolutely no cold flow up to 140°F is announced by The Garland Co. Known as "Fibre Glass Supercote," it contains millions of glass fibers that prevent movement of the asphalt cover and sagging or pulling away from high spots in temperatures up to 140°F. Because flow is prevented, oxidation of more than the thin top layer is stopped. This is said to eliminate the major cause of roof leaks—evaporation of underlying asphaltic oils. In addition to fibre glass, the new material is formulated with plasticizers and waterproofing oils. It is claimed that these penetrate and resaturate dried out roofing felts, keep coating from becoming brittle and provide a positive bond to old roof surfaces. Addition of long fiber asbestos further increases wear and weather resistance.

The coating can be applied just as it comes from the container with roofing brush or squeegee. It is reputed to flow smoothly over the roof surface, fill cracks and form a seamless black sheet that possesses no visual evidence of fibration. It is recommended for use over felt, composition, tin and corrugated iron, concrete and built-up roofs. It also is suitable as a final protective coating around sidewalls, chimneys, parapets, skylights and firewalls. New Supercote is available in 5-gallon pails, 30- and 55-gallon drums.

FIRST AID UNITS PACKAGED IN PLASTIC

(Use Key # 757 on Inquiry Card on page 1)

A NEW, more convenient unit system of industrial first aid, the exclusive 'C-Thru Unit System' with inspection window has been developed by Davis Emergency Equipment Co. The new system features units with plastic windows that permit the contents of a first aid kit to be seen and checked at a glance without removing the units from the kit. Each unit is wrapped in airtight cellophane with easy-to-open pull tab. A continuous red line signals an open package. Another convenience is a cover that can be folded back to uncover the contents for easy access.

Antiseptics and burn ointments are contained in 'one shot' transparent plastic tubes known as Swabettes and Unettes in which contents are always visible. An effective wound cleanser is put up in a larger transparent plastic tube. These have a patented rupture seal that makes them easy to use. The contents flow readily with slight squeeze pressure. Synol® soap wound cleanser has a tear tab for ease in opening. 'Swabettes' are fitted with cotton swab tips and contain Mercurochrome, Isodine, Merthiolate, Zephiran Chloride, iodine, and other antiseptics. 'Unettes' contain a single ready-to-use application of burn ointments: boric acid, petrolatum, Tannoid and other widely used burn ointments.

PAINT BRUSH STORAGE UNIT AND CONDITIONER

(Use Key # 758 on Inquiry Card on page 1)

STORING PAINT brushes in open pots and cans containing combustible solvents presents a serious fire hazard in the paint shop. This hazard is said to have been eliminated by storing brushes in a "vapor type brush conditioner" manufactured by the Wisconsin Laboratories, Inc. Called "Protexem" the unit stores brushes in an airtight metal container with a safety cover.

A vaporizing solvent evaporates from a wick or liner inside an airtight container. The vapor produced by this solvent is

purported to penetrate the brush and dissolve the binding oils or resins in paint, varnish, enamel or shellac. Brushes are kept soft and ready to use. The solvent vapor is claimed not to damage the bristles or the setting of the brush, whether natural or nlyon. The vapor solvent is available in pints and quarts.

FREIGHT CAR DOOR OPENER

(Use Key # 759 on Inquiry Card on page 1)

NEW IMPROVEMENTS in the Nolan Model H One-Man Car Door Opener have further increased its efficiency in opening

and closing balky freight car doors, reputedly to take no more than 20 seconds under any circumstances. A specially constructed hook with clevis attachment to the body of the car door opener now permits its use on any type of freight car door handle. It also permits the tool to line up for a direct pull of the chain into the case. The chain locking pawl is now equipped with a spring for very positive operation. A thumb button also is provided for quick release. The chain of the car door opener has been changed to use a high test unit with a breaking strength of approximately 3500 lbs. Available from the Nolan Company.

SIZE ANALYZER FOR AIRBORNE DUSTS

(Use Key # 760 on Inquiry Card on page 1)

An M-S-A particle size analyzer, a general purpose instrument for measuring size distribution of small particles at minimum cost, is announced by the Mine Safety Appliances Company. The new analyzer was designed for particles between approximately 0.1 and 40 microns, which include most airborne dusts, paint pigments, and many flours, chemicals and pharmaceuticals. Major units of this flexible analyzer system are special centrifuge tubes and a tube feeding chamber, an optical tube pro-

jector, and one or more special centrifuges. Three centrifuges were designed to assure reliability and provide constant speeds of 300 rpm, 600–1200 rpm, and 1800 rpm for predetermined times. A magnified image of the sediment column in a centrifuge tube is measured on a graduated screen of the M-S-A optical projector. Basic steps in particle analysis are preparation of a suspension of particles, transfer of suspension to the feeding chamber and then into a centrifuge tube in such a way as to leave a sharp layer of the suspension on top of the sedimentation liquid. Sediment height is read before and after centrifuging at predetermined times and speeds. Size distribution is determined from sediment height data.

ULTRASONIC INDUSTRIAL CLEANER

(Use Key # 761 on Inquiry Card on page 1)

A SELF-CONTAINED ULTRASONIC installation for cleaning, immersion or spray rinsing of hospital or industrial equipment is now available from Branson Ultrasonic Corporation. The Model H-50, "Sonogen" cleaner will process surgical instruments from several operations at one time, or handle the equivalent in badly soiled industrial parts. The stainless steel unit measures 27 x 36 x 42 in. high, with a counter top area of 21 x 36 in. Wash and rinse tanks (9 x 14 x 13 in. deep) are usually arranged for left to right work flow, although model H-50-R for reverse work flow is also available. Installation requires only connection to hot and cold water, drains, and a 110-volt, 60-cycle current source.

The "Sonogen" can be used industrially for removing carbon, grease, small chips and many insoluble soils from intricate parts in minutes. Oil, lapping compound, rouge and cutting fluids have been removed even from sintered metal. Often,

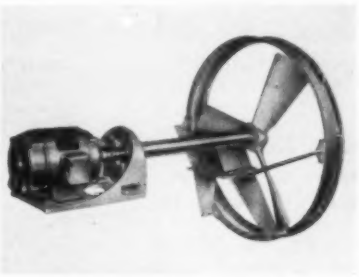
assembled units such as servos, anti-friction bearings and electronic sub-assemblies may be cleaned without dismantling, simply by dipping the entire unit in the ultrasonic bath. The Model H-50 generates powerful pulses of electrical energy at 40,000 cycles per second, which are converted by a transducer into mechanical vibrations of the same ultrasonic frequency. The transducer sends its energy uniformly through a detergent or other cleaner. The ultrasonically agitated liquid loosens and removes contaminants from all work surfaces throughout the tank.

HIGHWAY LANE MARKERS ADAPTED TO INDUSTRIAL SAFETY

(Use Key # 762 on Inquiry Card on page 1)

PLASTIC TRAFFIC markers have been adapted to commercial and industrial use by the Tech Industro Company. The markers, developed by the Miller Company, have been used in highway traffic control operations for many years. Marketed under the trade name "Leopard Safety Markers," the heavy duty plastic tape is available in white and traffic yellow in widths from one inch to one foot with up to three hundred feet per roll. It is also furnished in assorted sized circles, squares, letters and numerals.

The markers are said to be impervious to the chemical action of oil, grease, salt and other materials and withstand extremes of temperature, abrasion and impact. The markers can delineate traffic lanes, safety zones, crosswalks, bridge and tunnel interchanges, etc.



NEW EXTENSION SHAFT FANS

(Use Key # 763 on Inquiry Card on page 1)

THE PROPELLAIR Division of Robbins & Myers, Inc has introduced a new line of axial flow extension shaft fans designed for exhausting contaminated fumes from hoods or tanks, spray booth exhaust, oven recirculation and other installations requiring isolation of the fan motor from the air stream. For corrosive exhaust, special corrosion resistant coatings for the fan and the extension tube are factory applied when specified. Designated as "Type CE," the new fans are non-overloading and are thus suitable for use over a wide operating range from free air to 1½ inches static pressure.

Propellers, available in various multi-blade designs, are modern airfoil type made of cast aluminum-magnesium alloy and are carefully balanced for peak efficiency. Drive shaft and bearing assemblies are oversized for long life. Bearings are sealed (but lubricable if desired) and prelubricated with high temperature silicone grease. Heavy duty flexible couplings require no lubrication since the load is transmitted by compression of a flexible cushion, thus eliminating wear. Motors, made by Robbins & Myers, were expressly designed for these fans. All metal parts are coated with a corrosion inhibiting compound. Windings receive two dips and bakes, plus a final coating of sealer. All motors are equipped with oversize, prelubricated, sealed ball bearings and are cradled in a heavy base to maintain proper fan alignment.

HIGH VISIBILITY YELLOW RAINWEAR

(Use Key # 764 on Inquiry Card on page 1)

A NEW LINE of rainwear is announced by Industrial Products Company. Rainwear is available in cotton and nylon, coated with a high-visibility yellow neoprene. Jackets, pants, three-quarter and full length coats, hoods and hats are avail-

able. Garments are full cut to be worn over regular clothing. The new rainwear may be laundered, scrubbed with soap and water or dry-cleaned.

HOOK SWITCH FOR CRANE OR HOIST OVERLOADING

(Use Key # 765 on Inquiry Card on page 1)

DEVELOPMENT OF a new Dyna-Switch for the automatic prevention of hoist and crane overloading has been announced by W. C. Dillon & Co., Inc., manufacturer of scientific testing instruments. The new model features a lifting hook at the bottom, rather than the normal lifting eye. This hook, which offers a generous throat open-

ing, will accomodate almost any hoist or crane. Thus, the new model provides greater utility, as well as ease and speed of loading and unloading. A similar hook can also be installed at the top of the switch, in place of the normal eye, if desired. To protect against possible tampering or damage, a heavy metal case has also been added to all models in the line.

Easily attached to hoists or cranes, the new unit cuts off all power to the motor when overloading occurs. The operator must then press the reverse switch, returning the load to the floor. He must then remove surplus weight before the pick-up can be completed. The unit can be easily set in the field to operate at any one point between 500 and 10,000 pounds. It is available with one or two adjustable micro-switches to control mechanical forces at various load points and to ring bells or operate warning lights.

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THE JOHN DOE COMPANY, INC.
PROTECT YOURSELF
3
WAYS
There are three safe practice ways that do the most good in keeping free of accidents, all based on your personal desire to know safety and keep yourself safety-minded by studying the hazards of your work. They are
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Your Signature Here

NOTE:

Your Safety News is designed to promote better employer-employee relations. Every item is carefully weighed from this viewpoint.

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FALLS KILL 60 EVERY DAY

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(For details, use Key # Q-25 on card on page 1)

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